

Digital assets as the new alternative for institutional investors: market dynamics, opportunities and challenges

Supported by  Institutional

Digital assets represent a growing institutional opportunity

Digital assets are becoming increasingly interesting to institutional investors. Within this category, cryptocurrencies such as bitcoin and ether, non-fungible tokens (NFTs), and tokenised private funds and securities such as bonds and stocks are proving particularly attractive.^{1,2} The technologies underlying these assets are gaining broader acceptance throughout the financial world as well.

According to a 2023 survey, around 40% of financial market participants such as banks, wealth managers, investment banks and exchanges are using some form of distributed ledger technology or digital assets.³

As convergence on digital assets between traditional finance and digital-native players grows, how should institutions leverage expanding market opportunities and participants within the maturing ecosystem? And what are the key considerations for institutional investors within this rapidly changing marketplace?

Key considerations for institutional investors

This research brief presents insights on four key considerations for institutional investors that emerged from an Economist Impact roundtable discussion, sponsored by OKX, that took place in Dubai in the second quarter of 2024, which was supplemented by expert interviews and desk research. The four fundamental areas are:

- ① Institutional Asset Allocation
- ② Custody
- ③ Regulatory Development
- ④ Risk Management

This research discusses the maturing ecosystem of market participants and serves as a guide for investors to navigate the digital assets landscape by informing their decision-making.

Institutional investors view digital assets as a promising class that is set to expand substantially

Digital assets look set to become an inevitable staple in institutional portfolios in the future, as rising investments show. Increasingly mature blockchain technology and digital security infrastructure, ongoing efforts to achieve global regulatory clarity, and digital innovations such as tokenised real-world assets are driving institutional adoption. There is no end of action taking place around the world from leading financial players. Over US\$1bn worth of United States (US) treasuries are now tokenised across public blockchains. Meanwhile, the European Investment Bank successfully issued a £50m digitally native bond that combined public and private blockchains.⁴ In February 2024, the Hong Kong government issued the world's first multi-currency digitally native bond, gathering US\$766.8m worth of investments, including from asset managers, banks and insurance companies.⁵ Recently, the State of Wisconsin Investment Board disclosed that it had bought US\$99m of BlackRock's bitcoin exchange-traded fund (ETF).⁶

Given that the projected value of tokenised assets is expected to surpass US\$10trn by 2030, the market opportunity is vast.⁷ According to a 2023 survey, 69% of institutional investors anticipated increasing their allocations to digital assets and/or related products in the next two to three years.⁸ They also expect digital asset holdings to constitute 7.2% of their portfolios by 2027.⁹

Figure 1: The value of tokenised assets is projected to grow to US\$10.9trn by 2030, from US\$0.4trn in 2023.¹⁰

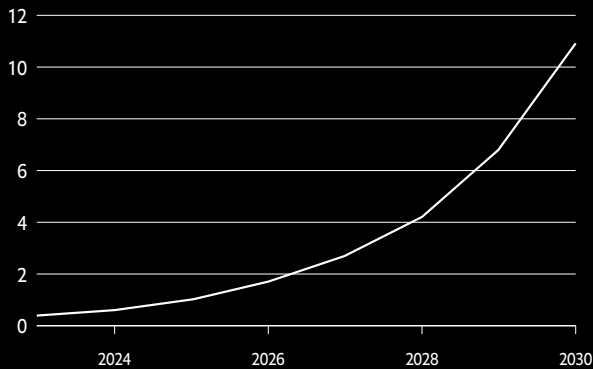
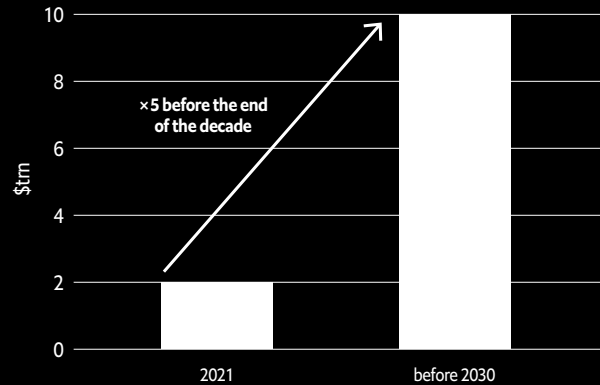


Figure 2: Crypto assets market capitalisation hit US\$2trn at the end of 2021 and is expected to increase fivefold before the end of the decade.¹¹



1

How is institutional portfolio allocation to digital assets progressing and what should investors consider?

“Asset management and banking clients are seeking exposure to digital assets. Diverse investment tools and products are emerging to meet this need, such as ETFs, exchange-traded notes, blockchain platforms powered by decentralised Web 3.0 technology and crypto phones.”

Thijs van Boven, head trader, digital assets, VanEck.

From venture capital and pension funds to crypto hedge funds, there is a growing consensus among institutional investors that digital assets, including cryptocurrencies, have an important place in asset allocation. At present, average digital asset allocations in institutional portfolios range from 1% to 5%, depending on risk appetite.¹² The positioning of digital assets within institutional portfolios has been focused on trading of cryptocurrencies, with bitcoin and ether representing the largest investment avenues. But institutional investors are exhibiting greater optimism around digital assets, encouraged by the expanding availability of a wider range of investment vehicles that take them beyond just cryptocurrencies. These newer options include spot exchange-traded funds, private equity/venture capital-style investments, crypto derivatives, stablecoins and NFTs. For example, the approval of 11 Spot Bitcoin ETFs provided a prodigious boost to overall inflows into Bitcoin, with cumulative investment by institutions reaching over US\$40bn in March 2024.¹³ Spot Ether ETFs exceeded US\$1bn in trading volume on their debut trading day in July 2024.¹⁴ The Securities and Futures Commission (SFC) of Hong Kong’s approval of Spot Bitcoin and Ether ETFs is expected to attract up to US\$25 billion into the market.¹⁵

Figure 3: Institutional investors plan to ramp up portfolio allocations to crypto products through diverse investment strategies.¹⁵



Note: The graph draws from a 2022 global survey and shows the proportion of respondents based on the investments they are planning to make in 2-3 years.

Looking closer at the current trends in institutional allocations reveals variations in the volume of digital assets under management (AUM). Firms with larger AUM allocate lesser shares: data show that 6% of firms with AUM greater than US\$500bn allocate between 5% and 10%, compared with 34% of firms with AUM under US\$50bn.¹⁷ Allocation behaviour is also influenced by the institutional investor category. For instance, traditional hedge funds remain cautious in increasing their portfolio exposure.

Data from a 2023 survey of hedge fund investors show that 54% of traditional hedge funds were unlikely to invest in cryptocurrency assets over the next three years.¹⁸ Although cautious about crypto investments, they are more bullish on tokenisation—31% acknowledged tokenisation as the most significant future market opportunity.

“The majority of portfolios will increasingly incorporate some form of digital assets as real-world assets become tokenised. Most securities, bonds and central bank digital currencies will all be on the blockchain moving forward.”

Ataf Ahmed, chief executive, Graphene Investments.

Institutional investors are increasingly recognising that the low correlation of digital assets with more established asset classes such as equities and fixed income makes them well suited as a diversifier in a multi-asset portfolio. Their idiosyncratic risk-return drivers further boost their diversification potential. “The role of digital currencies in a portfolio has parallels to commodities such as gold. Commodities can serve as a hedge against inflation. Stablecoins are perceived as alternatives to cash,” points out Rams Kanouni, chief executive at Capmetric. The precise impact of digital assets on portfolios, however, needs to be evaluated by institutional

investors against other strategic considerations, including their planned holding periods, portfolio rebalancing strategies and the position sizes of digital assets within their overall portfolios.¹⁹ These considerations, in turn, are driven by volatility tolerance thresholds and return goals.

Experts from the roundtable concurred that allocations to digital assets, including cryptocurrencies, will keep increasing in the future as institutions become familiar with the asset class, in tandem with fundamental developments like regulatory standardisation and the expanded availability of asset-backed crypto tokens.

2

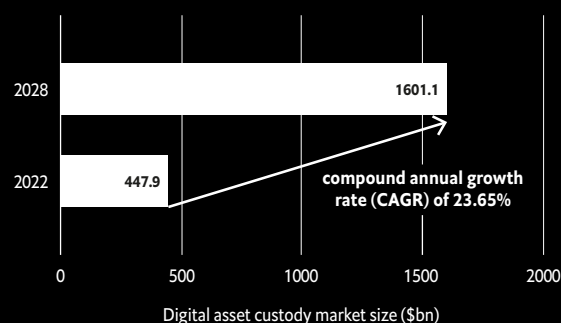
What are the key custody considerations around digital assets for institutional investors?

The rise of institutional-grade custodians is enabling investors to benefit from digital asset opportunities. These encourage participation by mitigating risks. Alongside this, traditional finance institutions such as custodial banks are also getting involved in establishing robust safety measures. This increased collaboration is also opening the doors to new opportunities for institutional investors against the backdrop of expanding regulatory and technological maturity.

“Currently, there is a clear split between exchanges that focus on digital assets and financial security assets, but five years from now, we will see the traditional brokers and custodians populating the space.”

Ataf Ahmed, chief executive, Graphene Investments.

Figure 4: As institutional investors’ exposure to digital assets expands, institutional-grade digital asset custody is a significant market opportunity for new and existing financial players.²⁰



As digital assets reside primarily online, they are vulnerable to risks emerging from the technology ecosystem. These include cybersecurity risks and hacking, systems failure, transaction irreversibility, and loss of private keys. In response to these challenges, custody solutions tailored to digital assets will remain a key driver of mainstream adoption among institutional investors. When assessing custody providers to find the right fit, institutional investors need to prioritise solutions that address their unique needs and goals.

- ⊕ Self-custody using hot and cold wallet (or hybrid) mechanisms for private key management allows investors to maintain complete control over their assets and directly oversee their security. However, “investors need some level of expertise to do that. Institutional investors mostly rely on digital native custodians,” remarks Ramdas Rao, who is the chief investment officer at a private family office. He also emphasises that this leads to increased responsibilities for investors in return for keeping the upside that would have gone to the third-party custody provider otherwise.
- ⊕ Through exchange wallets, investors can transfer key management to an exchange while maintaining access. Adequate segregation of client assets is crucial for exchange-hosted wallets, as commingled funds might heighten asset loss risk in the case of hacking and bankruptcy.²¹
- ⊕ A third-party custodian can also hold digital assets on behalf of investors. Demand for this option is particularly prominent among institutions: it is the first choice for 80% of crypto hedge funds and traditional hedge funds.²² “If large institutional investors want to be active in the digital assets space, they would need several well-recognised and trustworthy custodians so that they can distribute their assets and diversify the risk,” recommends Mr Kanouni. Institutional investors should work with custody providers that offer institutional-grade security mechanisms. For instance, regulated qualified crypto custodians are emerging as trustworthy partners for institutional investors. Compliance and licensing requirements allow qualified custodians to achieve the highest security standards by incorporating latest technological developments such as multi-party computation wallet solutions and regularly testing these security systems.²³ In February 2023, the US Securities and Exchange Commission (SEC) issued a proposed safeguarding rule to enhance investor protection, which requires clients’ assets, including crypto, to be maintained with a qualified custodian.²⁴

Figure 5: How can institutional investors partner with qualified custodians?



Regulatory compliance

Before establishing partnerships, undertaking rigorous due diligence of custodians' operational history and reputation will be crucial to avoid legal risks. This might be more critical in the case of digital assets compared with traditional assets. Institutional investors need to ensure that custodians hold the regulatory licences required by the specific jurisdiction they operate in, such as BitLicense in New York.²⁵ In addition, licenced custodians need to comply with anti-money laundering, know your customer and reserve requirements.



Reporting requirements

Custody providers need to establish transparency and trust by providing verified security auditing and monitoring regularly. Besides internal audits, a solid track record of third-party oversight supported by independently audited statements is critical. "For cryptocurrencies, live auditing will be very important for investors to ensure effective custody in real time," explains Mr Ahmed.

Proof of reserves is a key element of auditing to prove a custodian's solvency and financial stability and to ensure digital asset safety. Verification tools such as the Merkle tree and public wallet method can generate a custodian's balance sheet in real time. These tools can also monitor activities in individual accounts to shed light on custodians' fund management.²⁶



Security mechanisms and contingency measures

"Implementing encryption protocols, multi-factor authentication and regular security audits are ways to defend against cyberattacks and unauthorised access, ensuring the integrity of digital asset transactions," mentions Faisal Hasan, chief investment officer and head of asset management at Al Mal Capital. To improve the security infrastructure and ensure high-level data protection, custody providers are designing digital tools such as multi-signature wallets that require several keys to perform transactions, institutional-grade vaults, encrypted hardware security models and quorum authentication.^{27,28}

Robust contingency measures are essential for a market operating round the clock. Even in the face of sudden disruptions such as power outages, custodians should have effective business continuity plans and disaster recovery protocols in place to ensure asset protection.

Insurance coverage offerings from custodians can also help investors mitigate various digital asset risks. This could include, for example, specie insurance in the case of theft or loss and cyber insurance to protect against hacking.²⁹

A maturing ecosystem of market participants is unlocking institutions' access to digital assets

Financial players that streamline diverse products and services can become attractive partners for institutional investors that are looking to enter the digital assets space. These institutions can perform a role analogous to prime brokers in traditional finance, providing end-to-end services such as custody, trade execution, capital introduction, lending services and risk management.³⁰ Various companies are expanding their business lines by building internal capabilities or acquiring specialised firms. Emerging players and niche service offerings including over-the-counter desks, smart order routing, liquidity aggregators/providers/pools, and market makers tailored towards digital assets, will be key for institutions to perform large transactions smoothly.

Liquidity is crucial for institutional investors, as it affects market stability, transaction efficiency and price slippage.³¹ Liquidity providers such as investment banks, market makers and trading firms can help ensure price stability, especially in the case of large financial transactions. Procedures such as liquidity pools formed through smart contracts and automated market makers contribute to market liquidity.³² Liquidity and data fragmentation due to rising numbers of blockchain networks with different protocols can also lead to price inefficiencies and broader market fluctuations.³³ Cross-chain tokenised assets, cross-chain smart contracts, cross-chain bridges, wrapped tokens and interoperability protocols are some of the solutions service providers such as blockchain infrastructure and decentralised application (also referred to as dApps) developers are exploring.^{34, 35, 36}

Standardised frameworks and market integrity will become increasingly crucial as more and more players are interested in shaping the ecosystem. Integrating traditional finance protocols such as the financial information eXchange, which supports real-time data dissemination, into the digital assets space will enable market transparency, trust and integration.³⁷ “The future of digital assets will be characterised by a shift from single issuers and single owners of blockchain to a more decentralised multi-owner, multi-participant network,” highlights Jagadeshwaran Kothandapani, head of MEA and MEP payments at Citi Services. Experiments to develop multi-bank, multi-partner distributed ledgers to improve sovereign currency systems (eg, the Regulated Liability Network) signal growing recognition of the potential of digital assets from diverse stakeholders, including traditional players such as banks of blockchain-based digital assets.

For all players entering the digital assets ecosystem—from custodians to exchanges and brokerages—institutional-level compliance is emerging as a key requirement. Institutional investors should conduct rigorous know your business and due diligence questionnaire processes for third-party risk management.

3

What regulatory considerations around digital assets should institutional investors look out for?

“The onus is really on regulators to embrace the future and finalise sensible regulation that protects consumers and cultivates responsible innovation.”

Anthony Scaramucci, founder and managing partner, Skybridge Capital.

The maturing regulatory environment is one of the key drivers of digital asset adoption among institutional investors. To this end, various governments have made a concerted effort in recent years and months. The United Arab Emirates is the first country to establish a regulatory authority dedicated to regulating virtual assets.³⁸ In early 2024 the Hong Kong Monetary Authority published comprehensive guidance on the provision of digital asset custody services.³⁹ At around the same time, the SEC approved the creation of 11 Spot Bitcoin ETFs in the US.⁴⁰ Later, Hong Kong’s SFC followed by officially approving the launch of Spot Bitcoin and Ether ETFs.⁴¹ This increased the asset’s accessibility and, at the same time, meant that no actual crypto had to be held by the investor. In turn, demand was boosted.⁴²

As regulation remains fragmented, the convergence of developing frameworks will be key to addressing market uncertainty and ensuring consumer protection. In turn, this will unleash greater opportunities for investors. One area this could prove useful in is providing clarity on asset definitions.

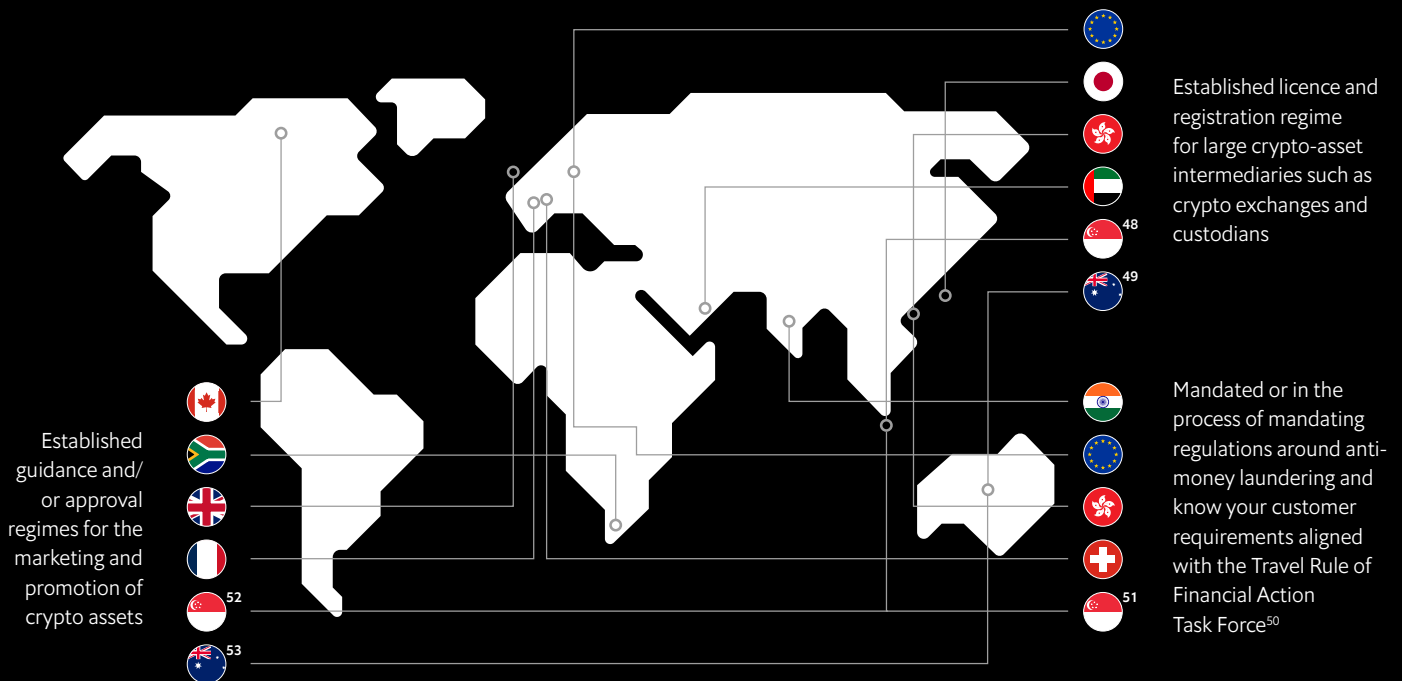
“How do you treat fiat currencies operating as tokens on distributed ledger technologies? Is it still deemed a currency [for regulatory purposes] or is it an asset? What, therefore, are the legal implications and what are the considerations from a tax perspective?”

Jagadeshwaran Kothandapani, head of MEA and MEP Payments, Citi Services.

Reaching a common understanding on this would shed light on reporting implications for investors. In its global regulatory roadmap, the Financial Stability Board highlights the importance of cross-border co-operation, including consistent supervisory and enforcement mechanisms. It strongly recommends information-sharing requirements to ensure international compliance.⁴³ For instance, the European Union showcased a successful step towards standardisation through its Markets in Crypto-Assets Regulation—the first cross-jurisdictional regulatory and supervisory framework—which came into force in 2023.⁴⁴

There is a diverse global regulatory approach to offshore cryptocurrency exchanges, which are key market participants. This ranges from jurisdictions encouraging the crypto ecosystem to others enforcing stringent controls.⁴⁵ Given the varying environments in which offshore exchanges operate, it is critical that they remain proactive and adaptable with regard to regulatory compliance, including developing advanced security and compliance infrastructure. Exchanges have recognised the need to flexibly respond to local regulatory requirements. In doing so, they can balance the need to grow with the need to maintain market integrity—a critical driver of investment in crypto assets.⁴⁶

Figure 6: Regulatory initiatives are carving diverse pathways for digital asset adoption across the globe.⁴⁷



Some regulators are also creating a safe sandbox environment to explore stablecoins. As of May 2024, stablecoins have a total market capitalisation of US\$169.5bn.⁵⁴

They can serve as a bridge between fiat currencies and digital assets, combining the reliability of traditional financial instruments with the innovativeness of blockchain technology.^{55,56} One recent example of this in practice comes from Singapore, which launched a stablecoin regulatory framework in 2023. This outlined crucial parameters, including operational restrictions, solvency requirements, and custody and audit obligations.⁵⁷

Regulators will continue to play a key role in supporting digitally native markets and developing decentralised finance services. Institutional investors need to maintain a keen understanding of regulatory progress to seize the market opportunity of digital assets.

4

How can institutional investors manage the risks associated with digital assets?

“Clear regulatory frameworks around investor protection mechanisms, tax implications and licensing requirements can guide institutional investors interested in digital assets. Exchanges, custodians and custody insurers need to prioritise robust infrastructure and security measures to safeguard digital assets.”

Faisal Hasan, chief investment officer and head of asset management, Al Mal Capital.

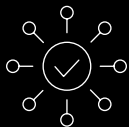
Risk management is a crucial step for digital asset allocation to become entrenched in institutional portfolios. This could cover operational, market and counterparty risks as well as those relating to regulations and compliance. While digital and traditional financial assets do face overlapping risks, digital assets have some characteristics that also create unique risks for this asset class. For example, inadequate historical data to assess future asset behaviour is one limitation, making market risk assessments challenging for investors. Given the need for institutional investors to access risk management solutions tailored to digital assets, it is beneficial to tap into and adapt the strategies used to manage risk within traditional finance.

Three key strategies are described below:



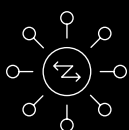
Value-at-risk models:

these are commonly used to manage portfolio risk in traditional finance and can be customised to account for the risks intrinsic to digital assets.



Scenario analysis and stress testing:

institutional investors can deploy scenario analysis and stress testing methods to account for the risks more relevant to digital assets. These methods typically test the resilience of these assets to exogenous market shocks and, for digital assets, create scenarios around stressors such as cyber attacks, technology failures and adverse macroeconomic conditions.

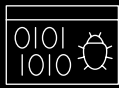


Reverse stress testing:

this starts by identifying rare scenarios that are the most likely to render investments in digital assets unviable. It then works backwards to identify plausible pathways that could lead to the rare outcomes. Finally, it helps identify measures to prevent these scenarios. Since the feverish pace at which the digital assets ecosystem is evolving can create challenges for predefining stress scenarios, reverse stress testing can help test vulnerability to tail risks.⁵⁸

In addition to market risk management, the swift pace of transactions in the digital assets ecosystem makes real-time monitoring of portfolio risk indispensable, in particular for institutional investors dealing in large denominations. Aided by technological advances, institutional participants can increasingly access solutions that enable effective and speedy risk management. A case in point is the use of machine learning insights to detect and investigate suspicious blockchain transactions.⁵⁹ Furthermore, analytics can be leveraged to automate transaction monitoring and anti-money laundering monitoring processes. Institutional investors can also tap into new-age software tools that help generate smart contract risk assessments and audits. These can fool-proof the security of transactions to be executed via smart contracts and manage counterparty risk.⁶⁰

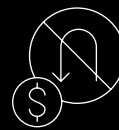
Finally, it is critical for institutional investors to manage risks intrinsic to the technology infrastructure of digital assets, including:



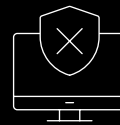
HACKING



**RANSOM
ATTACKS**



**TRANSACTION
IRREVERSIBILITY**



**SYSTEMS
FAILURE**

Experts concur that third-party oversight supported by independently audited statements will be crucial to mainstream digital asset adoption among institutions. This should be paired with internal audits that incorporate proof of reserves and reporting requirements.

Conclusion

“In the next ten years, mainstream consumers will be transacting on blockchains seamlessly without even realising they are using the technology.”

Anthony Scaramucci, founder and managing partner, Skybridge Capital.

Digital assets are disrupting the financial industry and institutional investors are looking to get a slice of the growing pie. A maturing ecosystem of market participants is already addressing various investor challenges every day. Understanding the four key areas this research brief examines—asset allocation, custody, regulation and risk management—will help them seize the opportunities while mitigating challenges effectively.

References

- ¹ Financial Times, "How will Web 3.0 drive digital assets investment", <https://www.ft.com/partnercontent/matrixport/how-will-web-3-0-drive-digital-assets-investment.html>
- ² EY, "Staying the course: institutional investor outlook on digital assets", https://www.ey.com/en_us/insights/financial-services/how-institutions-are-investing-in-digital-assets
- ³ World Economic Forum, "Why standards and controls are essential to the future of digital financial markets", <https://www.weforum.org/agenda/2024/01/digital-financial-markets-developing-standards-controls-davos24/>
- ⁴ European Investment Bank, "EIB issues its first ever digital bond in pound sterling", <https://www.eib.org/en/press/all/2023-030-eib-issues-its-first-ever-digital-bond-in-british-pounds>
- ⁵ FinanceAsia, "Deal Analysis: Hong Kong's HK\$6bn digital green bond offering", <https://www.financeasia.com/article/deal-analysis-hong-kongs-hk6bn-digital-green-bond-offering/494766>
- ⁶ Blockworks, "State of Wisconsin's investment board discloses nearly \$100M of BlackRock's bitcoin ETF", <https://blockworks.co/news/wisconsin-discloses-blackrock-ibit-shares>
- ⁷ Roland Berger, "Tokenization of real-world assets: unlocking a new era of ownership, trading, and investment", <https://www.rolandberger.com/en/Insights/Publications/Tokenization-of-real-world-assets-unlocking-a-new-era-of-ownership-trading.html>
- ⁸ EY, "Driving meaningful opportunity: tokenization in asset management", https://assets.ey.com/content/dam/ey-sites/ey-com/en_us/topics/financial-services/ey-driving-meaningful-opportunity-tokenization-in-asset-management.pdf?download
- ⁹ EY, "How tokenization in asset management is driving meaningful opportunity", https://www.ey.com/en_us/insights/financial-services/tokenization-in-asset-management
- ¹⁰ Roland Berger, "Tokenization of real-world assets: unlocking a new era of ownership, trading, and investment", <https://www.rolandberger.com/en/Insights/Publications/Tokenization-of-real-world-assets-unlocking-a-new-era-of-ownership-trading.html>
- ¹¹ BCG, "Standing still is not an option", <https://web-assets.bcg.com/24/f5/f3776eb4427fa57471dddc921211/bcg-global-wealth-standing-still-is-not-an-option-jun-2022-r-4.pdf>
- ¹² KPMG, "Investing in digital assets", <https://assets.kpmg.com/content/dam/kpmg/sg/pdf/2022/11/investing-in-digital-assets.pdf>
- ¹³ Barrons, "Bitcoin Tops \$60,000. The Force Behind Its Recent Surge", <https://www.barrons.com/articles/bitcoin-price-crypto-etf-wall-street-big-banks-c6547db0>
- ¹⁴ Wall Street Journal, "Spot Ether ETFs Hit \$1 Billion in Trading Volume on First Day", <https://www.wsj.com/livecoverage/stock-market-today-earnings-dow-sp500-nasdaq-07-23-2024/card/spot-ether-etfs-hit-1-billion-in-trading-volume-on-first-day-r1H6xnXEZz2uS2ASIRlh>
- ¹⁵ Yahoo Finance, "Hong Kong Approves Spot Bitcoin and Ethereum ETFs, Trading To Start on April 30", <https://finance.yahoo.com/news/hong-kong-approves-spot-bitcoin-064416209.html>
- ¹⁶ EY, "Staying the course: institutional investor outlook on digital assets", https://www.ey.com/en_us/insights/financial-services/how-institutions-are-investing-in-digital-assets
- ¹⁷ Ibid
- ¹⁸ PwC, "Rebuilding confidence in crypto", <https://www.pwc.com/gx/en/new-ventures/cryptocurrency-assets/5th-annual-global-crypto-hedge-fund-report-july-2023.pdf>
- ¹⁹ Bitwise, "The Case for Crypto in an Institutional Portfolio", https://fs.hubspotusercontent00.net/hubfs/6150553/The%20Case%20for%20Crypto%20in%20an%20Institutional%20Portfolio_10252021.pdf
- ²⁰ GlobeNewswire, "Digital Asset Custody Market-2023 will Revenue to Cross reaching USD 1601115.31 million by 2028 with CAGR of 23.65% during the forecast period, Top Companies report covers, Market-specific challenges, consumption by Regional data", <https://www.globenewswire.com/news-release/2023/02/09/2604673/0/en/Digital-Asset-Custody-Market-2023-will-Revenue-to-Cross-reaching-USD-1601115-31-million-by-2028-with-CAGR-of-23-65-during-the-forecast-period-Top-Companies-report-covers-Market-spe.html>
- ²¹ PwC Hong Kong, "The New York BitLicense: What is it and who needs to have one?", <https://www.pwchk.com/en/risk-assurance/digital-asset-custody-report-jul2023.pdf>
- ²² PwC, "Rebuilding confidence in crypto", <https://www.pwc.com/gx/en/new-ventures/cryptocurrency-assets/5th-annual-global-crypto-hedge-fund-report-july-2023.pdf>
- ²³ Atato Custody, "What is MPC (Multi-Party Computation) Wallet and why you Should Use It?" <https://www.atato.com/whats-mpc-wallet/>
- ²⁴ Goodwin, "Digital Asset Custody and the SEC's Proposed Safeguarding Rule: Significant Potential Implications and Unanswered Questions", https://www.goodwinlaw.com/en/insights/publications/2023/02/02_28-digital-asset-custody
- ²⁵ Capital Fund Law Group, "The New York BitLicense: What is it and who needs to have one?", <https://www.capitalfundlaw.com/blog/newyorkbitlicense>
- ²⁶ Ledger Academy, "What is Proof of Reserves (PoR)?" <https://www.ledger.com/academy/glossary/proof-of-reserves-por>
- ²⁷ See: <https://www.techtarget.com/searchcio/definition/multisig-multisignature>
- ²⁸ Finoa, "What it means to be a qualified crypto custodian", <https://www.finoa.io/blog/qualified-crypto-custodians/>
- ²⁹ GK8, "UNDERSTANDING DIGITAL ASSET INSURANCE: WHAT YOU NEED TO KNOW", <https://www.gk8.io/understanding-digital-asset-insurance/>
- ³⁰ The Block | Research, "What does Prime Brokerage look like for Digital Assets?" <https://f.hubspotusercontent00.net/hubfs/6024551/About%20-%20Genesis%20Prime%20Digital%20Asset%20Prime%20Brokerage%20Landscape.pdf>
- ³¹ The Block, "What is liquidity and why does it matter?", <https://www.theblock.co/learn/251470/what-is-liquidity-and-why-does-it-matter>
- ³² ULAM LABS, "Crypto Liquidity Provider: Importance and Implementation", <https://www.ulam.io/blog/best-crypto-exchange-liquidity-providers>
- ³³ Analog, "What Is Liquidity Fragmentation and Why It's Killing DeFi", <https://www.analog.one/blog/what-is-liquidity-fragmentation-and-why-its-killing-defi>
- ³⁴ Parallel Finance, "Breaking Down Liquidity Fragmentation: Parallel's Role in Unifying DeFi", <https://medium.com/@ParallelFi/breaking-down-liquidity-fragmentation-parallels-role-in-unifying-defi-455571e55ce>
- ³⁵ Chainlink, "What Are Cross-Chain Tokenized Assets?", <https://chain.link/education-hub/cross-chain-tokenized-assets>
- ³⁶ Chainlink, "What Are Cross-Chain Smart Contracts?", <https://chain.link/education-hub/cross-chain-smart-contracts>
- ³⁷ Solidus Labs, "The Growing Role of FIX in Real-Time Crypto Trade Surveillance", <https://www.soliduslabs.com/post/real-time-crypto-trade-surveillance-fix>
- ³⁸ IE University, "Winds of Regulation for Digital Assets", <https://www.ie.edu/insights/articles/winds-of-regulation-for-digital-assets/>
- ³⁹ Regulation Tomorrow, "HKMA issues new guidance on the provision of digital asset custodial services and the sale and distribution of tokenised products", <https://www.regulationtomorrow.com/asia/hkma-issues-new-guidance-on-the-provision-of-digital-asset-custodial-services-and-the-sale-and-distribution-of-tokenised-products/>
- ⁴⁰ CNBC, "SEC approves rule changes that pave the way for bitcoin ETFs", <https://www.cnbc.com/2024/01/10/sec-approves-rule-changes-that-pave-the-way-for-bitcoin-etfs.html>
- ⁴¹ CNBC, "Hong Kong regulators approve launch of spot bitcoin and ether ETFs", <https://www.cnbc.com/2024/04/15/hong-kong-regulators-approve-spot-bitcoin-and-ether-etfs-.html>
- ⁴² Forbes, "May 2024 Crypto Market Forecast", <https://www.forbes.com/advisor/investing/cryptocurrency/crypto-market-outlook-forecast/>
- ⁴³ PwC, "Navigating the Global Crypto Landscape with PwC: 2024 Outlook", <https://www.pwc.com/gx/en/industries/financial-services/assets/navigating-the-global-crypto-landscape-with-PwC-2024.pdf>
- ⁴⁴ Ibid
- ⁴⁵ Alekseenko, A.P. Model Framework for Consumer Protection and Crypto-Exchanges Regulation. *J. Risk Financial Manag.* 2023, 16, 305. <https://doi.org/10.3390/jrfm16070305>
- ⁴⁶ Heng Ching Tek, "Regulatory Developments and Challenges in the Crypto Exchange Arena: Navigating the Complex Landscape", <https://www.linkedin.com/pulse/regulatory-developments-challenges-crypto-exchange-arena-tek-z6b7c/>
- ⁴⁷ World Economic Forum, "Cryptocurrency regulations are changing across the globe. Here's what you need to know", <https://www.weforum.org/agenda/2024/05/global-cryptocurrency-regulations-changing/>
- ⁴⁸ Global Legal Insights, "Blockchain & Cryptocurrency Laws and Regulations 2024", https://www.globallegalinsights.com/practice-areas/blockchain-laws-and-regulations/singapore/&sa=D&source=docs&ust=1716182892361426&usg=AOvVaw2ET71twDy8tZv8Nk-FZ_fx
- ⁴⁹ Gilbert + Tobin, "Cryptoassets - Law Over Borders Comparative Guide 2024", <https://www.gtlaw.com.au/knowledge/cryptoassets-law-over-borders-comparative-guide-2024>

References

- ⁵⁰ FATF, "Virtual Assets: Targeted Update on Implementation of the FATF Standards on Virtual Assets and Virtual Asset Service Providers", <https://www.fatf-gafi.org/en/publications/Fatfrecommendations/targeted-update-virtual-assets-vasps-2023.html>
- ⁵¹ The Sumsuber, "Singapore Crypto Regulations—All You Need to Know in 2024", <https://sumsub.com/blog/singapore-crypto-regulations-all-you-need-to-know/>
- ⁵² Baker McKenzie, "Singapore: New MAS guidance restricts public marketing of cryptocurrencies", https://insightplus.bakermckenzie.com/bm/financial-institutions_1/singapore-new-mas-guidance-restricts-public-marketing-of-cryptocurrencies_1
- ⁵³ Gilbert + Tobin, "Cryptoassets - Law Over Borders Comparative Guide 2024", <https://www.gtlaw.com.au/knowledge/cryptoassets-law-over-borders-comparative-guide-2024>
- ⁵⁴ See: <https://defillama.com/stablecoins>
- ⁵⁵ Mustafa Syed, "Stabilizing the Future of Money: Regulating Stablecoins as an Alternative to Introducing Central Bank Digital Currencies (CBDCs)", <https://www.linkedin.com/pulse/stabilizing-future-money-regulating-stablecoins-alternative-syed-0zqsf/>
- ⁵⁶ PwC, "PwC Global CBDC Index and Stablecoin Overview 2023", <https://www.pwc.com/gx/en/financial-services/pdf/pwc-global-cbdc-index-and-stablecoin-overview-2023.pdf>
- ⁵⁷ Monetary Authority of Singapore, "MAS Finalises Stablecoin Regulatory Framework", <https://www.mas.gov.sg/news/media-releases/2023/mas-finalises-stablecoin-regulatory-framework>
- ⁵⁸ Moody's Analytics, "Is reverse stress testing a game changer?", <https://www.moodyanalytics.com/risk-perspectives-magazine/stress-testing-europe/approaches-to-implementation/is-reverse-stress-testing-a-game-changer>
- ⁵⁹ New York University School of Law, "Blockchain Analytics: A Reliable Use of Artificial Intelligence for Crime Detection and Legal Compliance", https://wp.nyu.edu/compliance_enforcement/2024/03/27/blockchain-analytics-a-reliable-use-of-artificial-intelligence-for-crime-detection-and-legal-compliance/
- ⁶⁰ TechTarget, "How to conduct a smart contract audit and why it's needed", <https://www.techtarget.com/searchsecurity/tip/How-to-conduct-a-smart-contract-audit-and-why-its-needed>

Disclaimer

This document is provided for informational purposes only and is not intended as financial advice, an investment recommendation, or an endorsement of specific trading strategies. The contents of this document, including any graphs, charts, and numerical data, are provided "as is" without warranty of any kind, whether express or implied. Digital assets are highly volatile and subject to market risks. The strategies, opinions, and analyses included in this document are based on information available at the time of writing and may change without notice. Reliance on this information for the purpose of making investment decisions is at your own risk. Past performance is not indicative of future results. OKX is not responsible for any losses or damages arising from the use of this document, including lost profits or investment losses. Not all OKX products are offered in all jurisdictions. Traders should conduct their own research and consult with a qualified financial advisor before making any investment decisions. The inclusion of any specific digital assets or trading strategies does not constitute an endorsement or recommendation by OKX.