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U.S. PUBLIC PENSION AND TRUST FUND INVESTMENT IN DIGITAL ASSETS

POLICY CONSIDERATIONS FOR PUBLIC SECTOR INVESTMENT IN BITCOIN, STABLECOINS, AND OTHER CRYPTOCURRENCIES

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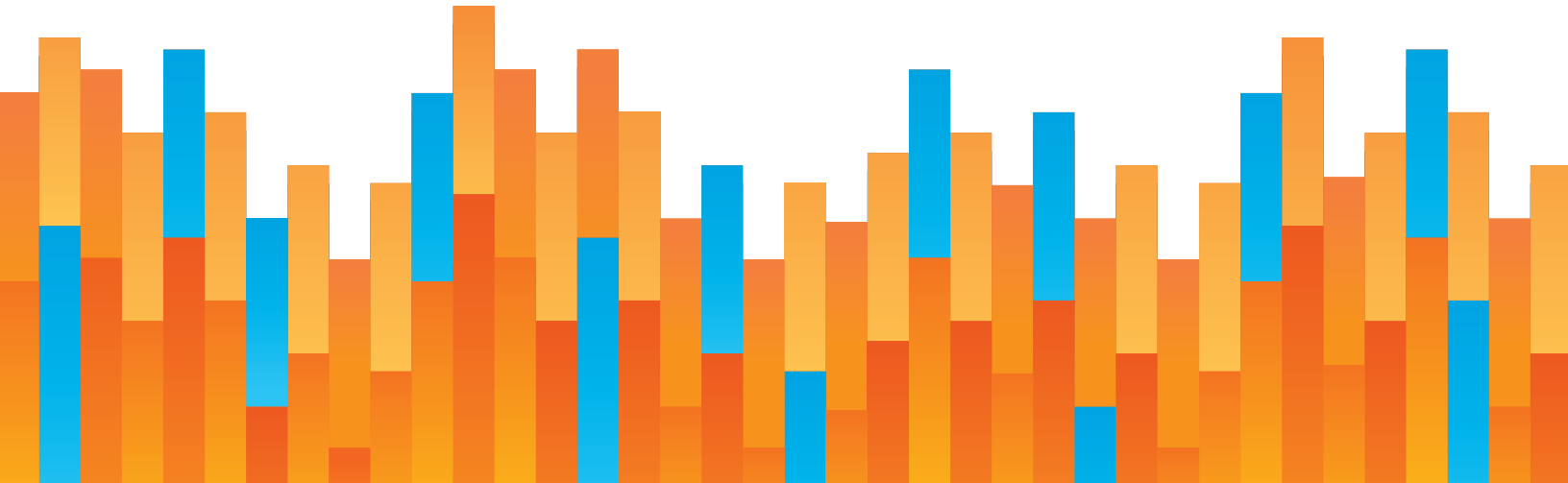

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EXECUTIVE SUMMARY

As Bitcoin, regulated stablecoins, and crypto-linked equities have gained legitimacy in institutional finance through recent federal actions, a handful of public pension funds have begun taking limited exposure, and many more have been quietly exploring the possibility of entering the market. This report finds that Bitcoin's growing institutional and monetary adoption, its fixed supply, and historical performance indicate that it *can* be a legitimate—though highly volatile—return and diversification instrument for public pensions.

Fully backed and properly regulated stablecoins can be treated as cash-equivalent settlement instruments rather than speculative assets. By contrast, most alternative cryptocurrencies—i.e., those other than Bitcoin, Ethereum, and stablecoins—should be avoided and remain dominated by governance risk, regulatory uncertainty, technological obsolescence, and near-zero recovery value in failure scenarios.

The role of Bitcoin and other digital assets in a pension portfolio is not without precedent. Many public pension systems already hold gold, which is also a non-yielding, inflation-sensitive diversifier and store-of-value asset. Public pensions routinely allocate to assets for hedging, appreciation, and diversification purposes rather than income generation. In fact, most public pensions already have exposure to cryptocurrencies through public equities such as MicroStrategy and Coinbase, which are part of major stock indices. Aggregating the investments identified in this report, total direct and indirect digital-asset exposure across public pensions already exceeds $1 billion.

This report establishes a prudent fiduciary framework for any public pension considering digital-asset exposure. Core principles include: (1) crypto investments must serve solely the fiduciary duty to maximize risk-adjusted returns; (2) total digital-asset exposure should be capped (generally 2%–10% of assets under management, or AUM) and sourced from existing alternative allocations to avoid increasing aggregate portfolio risk; (3) enhanced due diligence is required for custody, audit quality, counterparty risk, and regulatory compliance; (4) all direct and indirect crypto exposure must be fully disclosed in public reports; (5) crypto-specific stress testing (e.g., 80% drawdowns, exchange failure, regulatory bans) must be embedded in risk models; (6) rebalancing rules must account for crypto's heightened volatility; and (7) every allocation must include a planned exit strategy tied to custody failure, regulatory change, or breach of risk limits.

Applied rigorously, this framework provides guidance for public pensions evaluating Bitcoin and other crypto assets as controlled asymmetric-return tools and inflation hedges rather than as unbounded speculative assets—protecting both pension beneficiaries and taxpayers from uncompensated and unreasonable risk.

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DIGITAL ASSETS, PUBLIC POLICY, AND RETIREMENT

U.S. public pension systems manage over $5 trillion in assets and face more than $1.5 trillion in unfunded liabilities.[1] To close funding gaps and meet legally guaranteed benefits, many public pension funds have increased allocations to higher-risk, less-liquid asset classes such as real estate, hedge funds, private equity, and venture capital. According to Reason Foundation's *2025 Annual Pension Solvency and Performance Report*, 34% of public pension funds are allocated to such alternative investments.

Against this backdrop, some pension systems have shown interest in Bitcoin and other cryptocurrencies as potential sources of diversification and higher returns. In 2025, the value of one Bitcoin surpassed $125,000[2]—its highest level on record so far—and, at several points, its market capitalization briefly ranked it among the five largest global assets,

1 Ryan Frost, Mariana Trujillo, Truong Bui, Jordan Campbell, and Steve Vu, "Annual Pension Solvency and Performance Report," Reason Foundation. www.annual-pension-report.reason.org (5 Nov. 2025).

2 Sam Tobin and Joice Alves, "Bitcoin Hovers Near All-Time High," Reuters, 6 Oct. 2025. www.reuters.com/business/bitcoin-hovers-near-all-time-high-2025-10-06 (10 Nov. 2025).

exceeding the market value of both Alphabet (Google) and Amazon.[3] But this climb was not smooth. Bitcoin first crossed $60,000 in 2021,[4] then experienced a major drawdown in 2022–2023, when prices fell back near or below $25,000,[5] before rebounding sharply in 2024 and 2025.

Many analysts remain skeptical of Bitcoin's prospects as a usable currency rather than a speculative asset. Its extreme volatility, technological novelty, and vulnerability to regulatory shocks concern many.

Despite concerns, adoption is occurring. As digital assets have become more mainstream and regulated, pension systems are joining many other institutional investors by increasingly building digital assets in their portfolios. As of October 2025, U.S. public pensions collectively hold over a billion dollars in direct Bitcoin and cryptocurrency-related assets, and allocations are expected to grow following federal congressional and regulatory actions, including the advancement of crypto industry boundary-defining laws (e.g., GENIUS Act) and SEC approval of spot Bitcoin ETFs and stablecoin reserve requirements.

This Reason Foundation report provides a prudent framework for public pension systems considering cryptocurrency allocations. It outlines best practices for allocation limits, investment vehicles, risk management, and governance to ensure any exposure is deliberate, transparent, and consistent with fiduciary duty.

1.1 EXTERNAL OPINIONS

Analysts have expressed reservations about the validity of adding cryptocurrencies to pensions or other retirement investment portfolios. In 2022, the Government Finance Officers Association (GFOA) issued an advisory warning governments to avoid using or investing in cryptocurrency, citing a range of concerns, including crypto's legal and

[3] Omkar Godbole, "Bitcoin Overtakes Amazon as the Fifth-Largest Asset, Hitting $2.16 Trillion Market Cap," CoinDesk, 21 May 2025. www.coindesk.com/markets/2025/05/21/bitcoin-overtakes-amazon-as-the-fifth-largest-asset-hitting-usd2-16t-market-cap (12 Nov. 2025).

[4] "Bitcoin Surges Past $60,000 for First Time," BBC News, 13 Mar. 2021. www.bbc.com/news/business-56390409 (10 Dec. 2025).

[5] Sam Reynolds, "Bitcoin Falls Below $20K as 2023 Rally Reverses," CoinDesk, 10 Mar. 2023. www.coindesk.com/markets/2023/03/10/bitcoin-falls-below-20k-as-2023-rally-reverses (10 Dec. 2025).

regulatory status, extreme volatility, and potential illiquidity (though GFOA noted it would revisit its advice depending on future shifts in federal regulatory approach).[6]

Similarly, American Enterprise Institute fellow Andrew Biggs warned in 2022 that "it's not entirely clear what a cryptocurrency should be worth, and thus their values fluctuate wildly along with the sentiment of buyers and sellers."[7] More recently, Boston College Center for Retirement Research senior advisor Alicia Munnell likened Bitcoin in retirement plans to "speculative and volatile" assets and "much more like gambling than a productive investment."[8]

"After more than a decade of maturation marked by extreme volatility, regulatory friction, and rapid innovation, digital assets appeared to reach a structural inflection point in 2025."

After more than a decade of maturation marked by extreme volatility, regulatory friction, and rapid innovation, digital assets appeared to reach a structural inflection point in 2025. This shift was driven by a confluence of factors: the incoming Trump administration's directive to position the United States as a global leader in digital assets;[9] favorable rulemaking under the Paul Atkins–led U.S. Securities and Exchange Commission (SEC), including "Project Crypto";[10] the July 2025 passage of the GENIUS Act establishing statutory oversight of stablecoins alongside several pending digital-asset bills in Congress (e.g., the

6 Government Finance Officers Association, "Abstain from Using and Investing in Cryptocurrency for Government Operations," 4 Mar. 2022. www.gfoa.org/materials/cryptocurrency-advisory (10 Dec. 2025).

7 Andrew G. Biggs, "The Irony of Gambling with Your Retirement Money to Buy Bitcoin: It Makes the Most Tax Sense," *MarketWatch*, 3 May 2022. www.marketwatch.com/story/the-irony-of-gambling-with-your-retirement-money-to-buy-bitcoin-it-makes-the-most-tax-sense-11651578849 (8 Nov. 2025).

8 Alicia H. Munnell, "3 Reasons Why Bitcoin in Your 401(k) Is Still a Terrible Idea." *MarketWatch*, June 14, 2025. www.marketwatch.com/story/3-reasons-that-bitcoin-in-your-401-k-is-still-a-terrible-idea-1a319051 (8 Nov. 2025).

9 Exec. Order No. 14178, 90 Fed. Reg. 8647 (31 Jan. 2025). www.federalregister.gov/documents/2025/01/31/2025-02123/strengthening-american-leadership-in-digital-financial-technology (10 Dec. 2025).

10 Securities and Exchange Commission (SEC), "The SEC Launches 'Project Crypto'," updated 18 Nov. 2025. www.sec.gov/about/sec-launches-project-crypto (15 Dec. 2025).

CLARITY Act and the Anti-CBDC Surveillance State Act);[11] and, critically, new regulatory pathways allowing institutional investors—including public pension systems—to gain direct spot Bitcoin exposure through regulated custodians and broker-dealers, rather than solely through derivatives or ETFs.[12]

With an increasing number of traditional investment advisors starting to recommend modest (0%–5%) portfolio allocations to Bitcoin and other digital assets to those interested, and as the approval of Bitcoin and Ethereum-based ETF funds makes crypto more accessible for large institutional investors, it is reasonable to expect a growing interest in digital asset investment among U.S. public pension systems over the next five to 10 years. For example, in December 2025, Bank of America expanded its wealth-management offerings to include crypto ETFs. Chris Hyzy, CIO of Bank of America Private Bank, noted that "for investors with a strong interest in thematic innovation and comfort with elevated volatility, a modest allocation of 1% to 4% in digital assets could be appropriate."[13]

Fidelity has offered similar guidance in its paper *The Case for Bitcoin*, which argues that both the upside and the risk-return relationship indicate that "allocations of 2%–5% (7.5% for young investors) could have an outsized positive impact in an optimistic adoption scenario, allowing annual retirement spending to increase 1%–4%, while limiting the loss to annual retirement income to less than 1% if bitcoin were to lose all its value."[14]

Rising adoption is already visible among the largest university endowments, which often serve as trendsetters for broader institutional adoption. As of Q3 2025, Harvard's endowment holds half a billion dollars (US$443 million) of BlackRock's iShares Bitcoin

11 White House, "Fact Sheet: President Donald J. Trump Signs GENIUS Act into Law," 18 July 2025. www.whitehouse.gov/fact-sheets/2025/07/fact-sheet-president-donald-j-trump-signs-genius-act-into-law (8 Nov. 2025)

12 "Spot Crypto Products Begin Trading on CFTC-Registered Exchanges," Reuters, 4 Dec. 2025. www.reuters.com/legal/government/spot-crypto-products-begin-trading-cftc-registered-exchanges-2025-12-04 (10 Dec. 2025).

13 David Hollerith, "Bank of America Backs 1–4% Crypto Allocation," *Yahoo Finance*, 2 Dec. 2025. www.finance.yahoo.com/news/bank-america-backs-4-crypto-125733181.html (12 Dec. 2025).

14 Jurrien Timmer et al., "The Case for Bitcoin," Fidelity Investments, updated 1 Aug. 2025. www.institutional.fidelity.com/app/literature/view?itemCode=9911424&renditionType=PDF (12 Dec. 2025).

Trust (IBIT),[15] representing nearly 1% of Harvard's $57 billion endowment.[16] In Q3 2025, Brown University declared $14 million of the same ETF,[17] more than double its $5 million holding in Q1,[18] with the ETF now representing about 0.2% of its $7.2 billion endowment.[19]

> *Rising adoption is already visible among the largest university endowments, which often serve as trendsetters for broader institutional adoption.*

1.2 PUBLIC PENSION RISK AND THE NEED FOR A PRUDENT INVESTMENT FRAMEWORK FOR DIGITAL ASSETS

U.S. public pension systems currently face over $1.5 trillion in unfunded liabilities, the vast majority of which are the ultimate legal responsibility of state and local taxpayers.[20] This situation is the result of a confluence of factors, including the dot-com and great recession market shocks, overly optimistic investment return assumptions, inaccurate economic and demographic projections, market volatility, and a long-running trend toward increased risk-

15 Harvard Management Company, *Form 13F-HR - Quarterly report filed by institutional managers, Holdings* (Q3 2025), filed 14 Nov. 2025. Accessed via SEC EDGAR search: www.sec.gov/Archives/edgar/data/1082621/000119312525283114/0001193125-25-283114-index.html (8 Dec. 2025).

16 Harvard University, "Financial Report: Fiscal Year 2025", 2025. www.finance.harvard.edu/sites/g/files/omnuum12671/files/2025-10/fy25-financial-report.pdf (22 Dec. 2025).

17 Brown University, *Form 13F-HR - Quarterly report filed by institutional managers, Holdings* (Q3 2025), filed 14 Nov. 2025. Accessed via SEC EDGAR search: www.sec.gov/Archives/edgar/data/1664741/000090445425000558/0000904454-25-000558-index.html (8 Dec. 2025).

18 Brown University, *Form 13F-HR - Quarterly report filed by institutional managers, Holdings* (Q1 2025), filed 2 May 2025. Accessed via SEC EDGAR search: www.sec.gov/Archives/edgar/data/1664741/000090445425000234/0000904454-25-000234-index.html (8 Dec. 2025).

19 Brown University, "Endowment Report 2024," 2024. www.investment.brown.edu/sites/default/files/Reports/INV_Endowment Report FY24_MP-4025-accessibility tagged-compressed.pdf (22 Dec. 2025).

20 Frost, Trujillo, Bui, Campbell, and Vu, "Annual Pension Solvency and Performance Report."

taking among public sector pensions—manifested in the significant ramp-up in the share of pension portfolios allocated to private equity and other alternative investments.

American public pensions already carry a high degree of risk in their asset allocation relative to those of other countries. This risk is amplified by the fact that public pension liabilities are discounted using expected investment returns rather than prevailing market interest rates—which is what private pensions are required to do. This is especially critical because most public pension systems have materially overestimated long-term investment returns in the past, leading to a systematic underestimation of liabilities and persistent underfunding. While many plans have begun to address this mismatch, gaps remain, and many state and local pension systems continue to assume returns that exceed their 20- to 24-year average realized performance.[21]

Taxpayers generally bear all the financial risks of public pensions. No matter how investments perform, in almost all instances, state and local governments are on the hook to honor all pension promises in full.

Given this dynamic, any investment decision by a pension system to enter new and uncertain asset classes should be thoroughly interrogated in advance to fully understand the potential risks to taxpayers who ultimately back public pension obligations. A disciplined, rules-based framework is essential to ensure that any exposure to Bitcoin or other digital assets is deliberate, transparent, and consistent with fiduciary duty—the legal obligation of pension trustees to act solely in the interest of plan beneficiaries, manage assets prudently, and avoid unnecessary or uncompensated risk.

> *Pension systems should be cautious not to let optimism about digital asset innovation distract from the need for sound portfolio management.*

Pension systems should be cautious not to let optimism about digital asset innovation distract from the need for sound portfolio management. Emerging technologies such as Bitcoin, DeFi, and other cryptocurrencies are still in the early stages of market maturity, and

[21] Ibid.

their long-term performance under varying economic conditions remains unclear. This makes early allocations inherently more complex and riskier.

Though crypto returns can be astronomical, so can the associated risks. There are many different types of products in the crypto market, and there is no established playbook. Early adopters are essentially investment pioneers who must navigate with heightened prudence and critical thinking, unable to lean on conventional wisdom.

> *… Bitcoin (and some other cryptocurrencies) have outperformed every other asset class by multiples over the last five to 10 years (e.g., gold, real estate, the S&P 500).*

That said, Bitcoin (and some other cryptocurrencies) have outperformed every other asset class by multiples over the last five to 10 years (e.g., gold, real estate, the S&P 500). Its limited supply, growing institutional acceptance, and emerging network effects could deliver outsized returns even with a small allocation. This could help pension funds diversify their return streams, hedge against inflation, and as a result, improve public pension funding ratios and reduce pension costs for state and local governments. However, without a disciplined framework and strict risk controls, even a small allocation could cause significant volatility and introduce new vulnerabilities for already strained public pension systems.

PART 2

WHAT ARE DIGITAL ASSETS?

"Digital assets" is a term that has come to encompass a broad range of technologies—including cryptocurrency, non-fungible tokens (NFTs), and stablecoins—that facilitate secure, transferable ownership rights in emergent digital domains. This section will examine the three primary categories of digital assets relevant to public pension systems: Bitcoin, stablecoins, and alternative coins and tokens.

2.1 BITCOIN

Bitcoin is a peer-to-peer digital payment system and the first successful implementation of a blockchain—an immutable, distributed ledger of digital transactions maintained by a global network of computers. It is a private, decentralized payment infrastructure that does not rely on banks or financial institutions to validate transactions.

Bitcoin is a unique asset because scarcity is built into its protocol from inception. A fundamental feature of the Bitcoin protocol is its hard cap on the total number of Bitcoin that can ever be mined, a fixed supply of 21 million Bitcoin. This scarcity mimics, and in some ways improves upon, the qualities of precious metals like gold and diamonds. Precious metals can continue to be mined, and high prices motivate new mining ventures and technological developments that increase extraction and, consequently, market supply over time. They are therefore not truly "fixed" in supply.

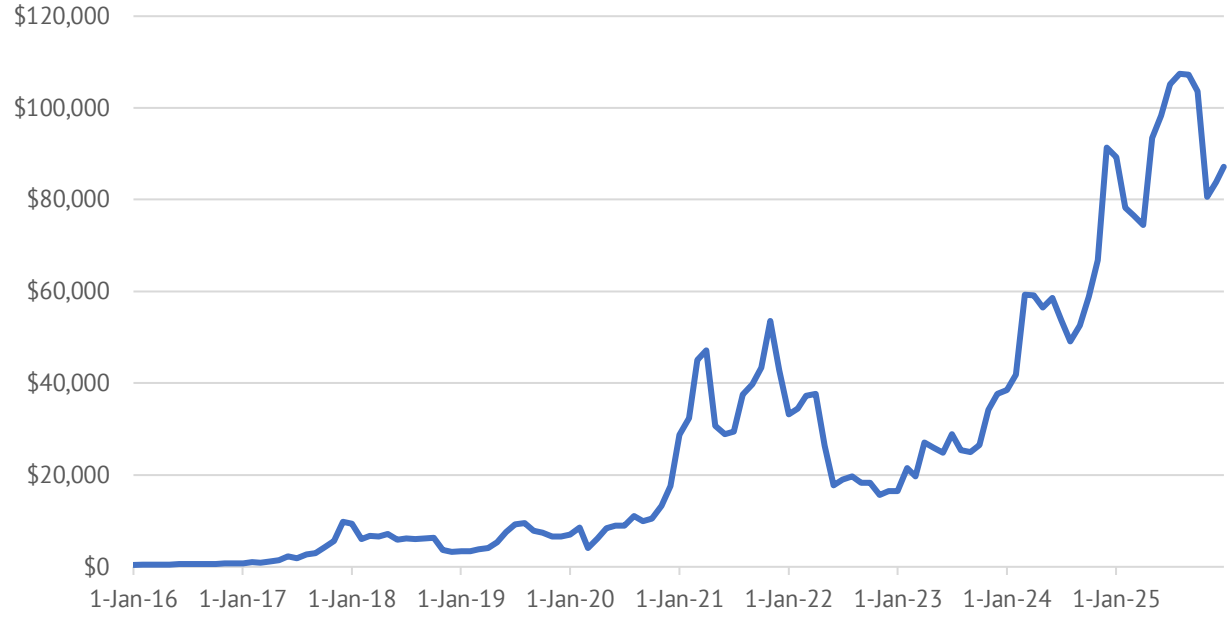
In contrast, once all Bitcoins are mined, no amount of demand can increase market supply. Most of its supply has been exhausted–95% of the Bitcoin that can be mined has already been mined. This limited supply drives Bitcoin's value proposition as a hedge against inflation and centralized monetary policies.

In addition to its fixed supply, Bitcoin offers several other positive attributes relative to government-issued fiat currencies like the U.S. dollar, such as:

- Decentralized, with no third party needed to clear transactions
- Inexpensive, fast transactions
- Harder to seize or freeze
- No need for a deposit institution (self-custody)
- Doesn't require physical infrastructure
- Enables asset transfers across borders despite tax or capital restrictions

In October 2025, following the passage of several crypto-friendly regulatory measures—including the executive order establishing a strategic U.S. Bitcoin reserve, significant deregulation by the SEC, and enactment of the GENIUS Act's stablecoin framework—Bitcoin climbed to a new all-time high of over $126,000.

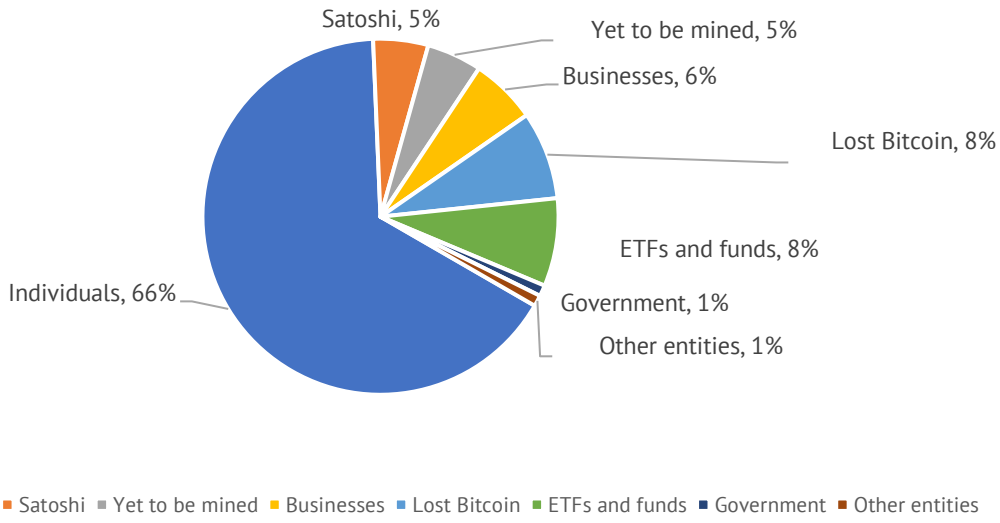
FIGURE 1: BITCOIN PRICE CHART, 2016–2025



Source: Yahoo Finance, Monthly Bitcoin USD Price (BTC-USD) 2016–2025.

Bitcoin is already used by millions worldwide, with the majority of supply held by individual investors—about 66% of all coins. Funds and ETFs currently account for roughly 8%, while an estimated 8% is permanently lost, and about 5% remains to be mined. It is estimated that 1.5% of all Bitcoin is owned by governments.

FIGURE 2: BITCOIN OWNERSHIP BREAKDOWN



Source: River Financial, "Who Owns the Most Bitcoin?" www.river.com/learn/who-owns-the-most-bitcoin/

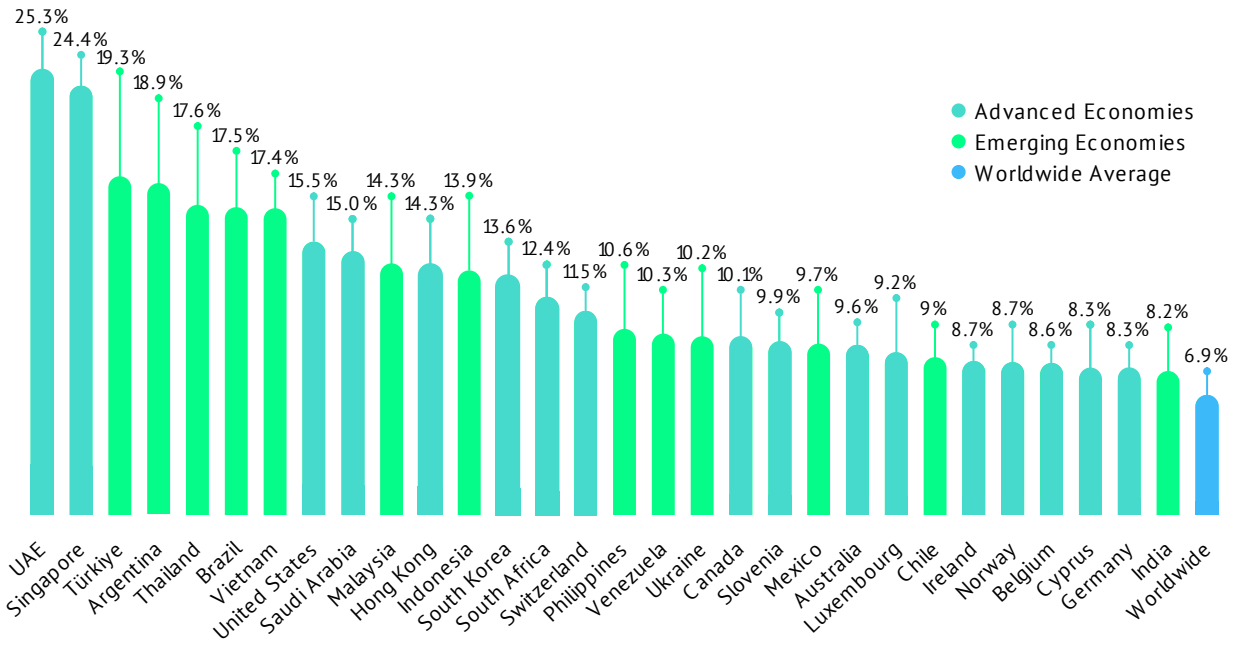
The 8% of Bitcoin's total supply that is permanently inaccessible results from lost private keys or early custody mistakes. Although such losses have become much less common as institutional custody and key-management practices have matured, this figure is a reminder of the importance of strong custody, governance, and risk controls for any institution interested in acquiring cryptocurrencies.

Despite what some might believe, Bitcoin demand isn't explained by speculation; millions already use it as a currency and payment method. Adoption is particularly high in parts of Africa, Latin America, and Asia, where households turn to digital assets to escape inflation, protect their savings, and bypass poor banking infrastructure. In countries such as Saudi Arabia, UAE, Venezuela, Nigeria, and China—places where your sexual orientation, religion, and speech can put your life and wealth in danger—use is also tied to avoiding capital controls and government surveillance.

Cryptocurrency ownership rates in emerging economies consistently outpace the global average: more than 20% of adults in nations such as the UAE, Singapore, and Türkiye report

holdings, compared with roughly 7% worldwide and 16% in the United States (see Figure 3).

FIGURE 3: TOP 30 COUNTRIES WITH THE HIGHEST CRYPTOCURRENCY OWNERSHIP RATE IN 2024

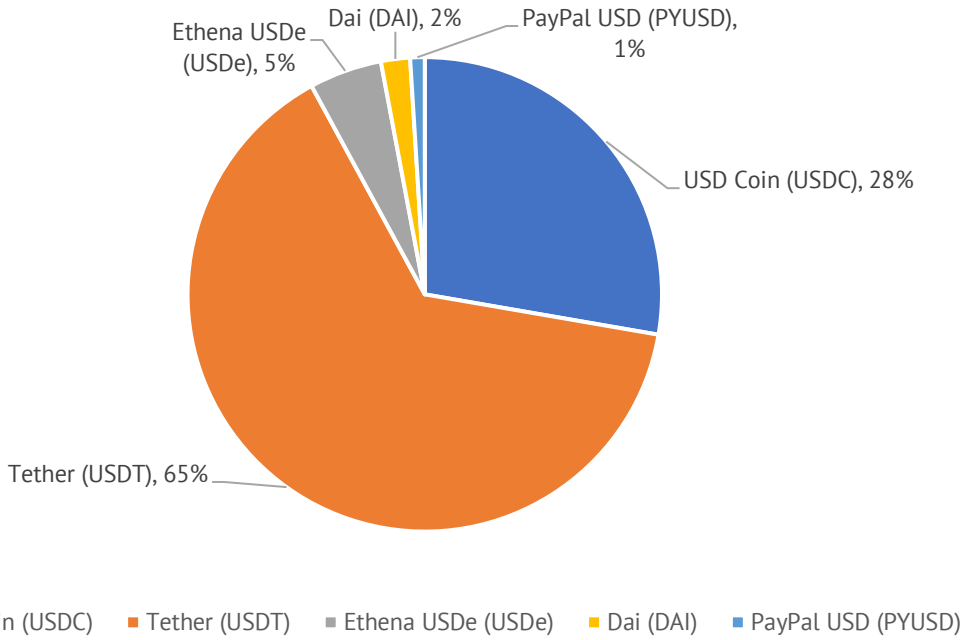


Source: Triple-A, "The State of Global Digital Currency Ownership in 2024," https://www.triple-a.io/cryptocurrency-ownership-data

2.2 STABLECOINS

As the name suggests, stablecoins are digital tokens (or blockchain-based assets) designed to maintain a stable value by pegging the "coin" to a fiat currency—most often the U.S. dollar—through full collateralization with cash or cash-equivalent reserves, usually short-term U.S. Treasuries. Some of the more widely used stablecoins today include Tether (USDT), USD Coin (USDC), and Dai (DAI), each of which is pegged to the dollar at a 1:1 reserve ratio.

FIGURE 4: STABLECOIN MARKET SHARES



Source: StableCoin.Com, "Stablecoin Market Cap Analysis" (as of Dec 2025), www.stablecoin.com/market-cap/

Well-regulated, fully backed stablecoins can function as a low-volatility digital mechanism for holding traditional assets, offering instant settlement and global transferability. Stablecoins target value stability by applying one of two models:

- **Fully backed models** hold reserves in cash, insured bank deposits, or short-term U.S. Treasuries, all of which are redeemable 1:1 for the pegged currency.
- **Algorithmic or undercollateralized models** try to maintain the 1:1 peg by programmatically adjusting supply—that is, minting new tokens when the price rises above the peg and removing tokens from circulation when it falls below.

In a sense, they are self-executing contracts: the "backer" holds the reserves and commits to redeeming tokens for their pegged value. This commitment is enforced through both the coin's code (e.g., smart contracts) and regulatory requirements.

The risks, volatility, and speculative dynamics discussed later in this analysis for cryptocurrencies do not fully apply to well-regulated, asset-backed stablecoins. For investment policy purposes, many stablecoins could be treated like a new vehicle to invest in traditional cash-equivalent holdings rather than as a separate speculative asset class—though they still carry *substantial* counterparty risk tied to the issuer's reserve management,

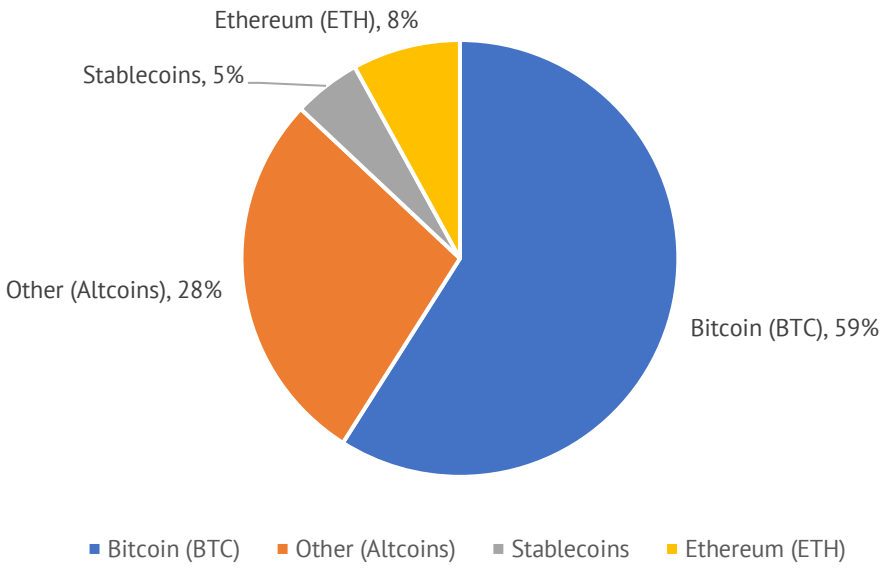
custody arrangements, and regulatory compliance, much like many traditional financial instruments.

2.3 ALTERNATIVE CRYPTOCURRENCIES AND TOKENS

Beyond Bitcoin and stablecoins, thousands of alternative cryptocurrencies ("altcoins") and tokens have emerged to offer a diverse range of functions—from alternative digital currencies to decentralized application platforms (e.g., Ethereum, Solana, Cardano) to niche protocol tokens that serve specialized functions (e.g., governance, transaction support, blockchain/sidechain interoperability, data integration). Some power smart contract platforms, while others enable DeFi services, non-fungible tokens (NFTs), or on-chain governance systems and protocols. Others are tied to specific applications, such as gaming, supply chain tracking, or privacy-focused transactions.

Bitcoin, Ethereum, and stablecoins accounted for 72% of the crypto market in December 2025, while altcoins represented only 28% (see Figure 5).

FIGURE 5: DIGITAL ASSETS BY MARKET SHARE



Source: CoinGecko, "Bitcoin (BTC) Dominance Chart" (as of Dec 2025), www.coingecko.com/en/charts/bitcoin-dominance (accessed Dec. 18, 2025).

These assets vary widely in governance structures, technical maturity, and liquidity. Many have concentrated control among early developers or token holders, creating governance

and security vulnerabilities. Their near- and long-term viability often depends on continuous developer engagement, user adoption, transparent governance, and sustained network effects.

From an investment standpoint, altcoins face a range of critical risks to consider:

- **Obsolescence Risk:** if a competing protocol emerges offering better performance or security.
- **Regulatory Risk:** if individual tokens are deemed unregistered securities or violate jurisdictional rules.
- **Market Risk:** due to low liquidity, thin order books, and susceptibility to large price swings from a small number of trades.
- **Fraud and Governance Failure Risk:** Pre-revenue or lightly regulated projects are vulnerable to "rug pulls," where developers or controlling parties abruptly withdraw funds or abandon the project, or to schemes that are, at their core, structured as Ponzi operations. High-profile examples include:
    - OneCoin (2014–2017): $4+ billion global Ponzi scheme masquerading as a cryptocurrency, with no functional blockchain.[22]
    - Africrypt (2021): $3.6 billion loss when founders disappeared after claiming a "hack."[23]
    - AnubisDAO (2021): $60 million drained from investor funds within 24 hours of launch.[24]
- **Permanent Value Loss:** While a few large-cap altcoins (e.g., Ethereum) have achieved substantial adoption and liquidity, the majority remain highly speculative, with many having lost nearly all their market value not too long after their peak.

[22] "OneCoin Ponzi Scheme: The $4 Billion Cryptocurrency Scam Explained," Investopedia, 7 Sep. 2025. www.investopedia.com/terms/o/onecoin.asp. (4 Jan. 2025).

[23] Roxanne Henderson and Loni Prinsloo, "South African Brothers Vanish, and So Does $3.6 Billion in Bitcoin," Bloomberg, 23 June 2021. www.bloomberg.com/news/articles/2021-06-23/s-african-brothers-vanish-and-so-does-3-6-billion-in-bitcoin. (4 Jan. 2025).

[24] Carla Mozée, "A crypto project that raised $60 million overnight using a dog meme saw all of that money go missing in what may have been a phishing attack," Business Insider, 31 Oct. 2021. www.markets.businessinsider.com/news/currencies/crypto-project-phishing-attack-anubisdao-olympusdao-token-sale-2021-10. (4 Jan. 2025).

2.4 COMPARING DIGITAL ASSETS

While all are considered digital assets in the broadest categorical sense, there are significant differences between Bitcoin, stablecoins, and the thousands of altcoins that have emerged over the past two decades. Table 1 summarizes each relative to purpose, supply limitations, volatility, and other factors.

TABLE 1: SUMMARY OF MAJOR DIGITAL ASSET CATEGORIES

Digital Asset Type	Bitcoin	Stablecoins	Alternative Cryptocurrencies & Tokens
Purpose(s)	Store of value; medium of exchange	Bridging fiat & digital currency; digital payments	Specialized utilities; speculative investment; smart contracting; governance
Supply	Capped (21 million Bitcoin)	Typically limited by the amount of backing reserves	Varies depending on purpose; can be fixed, inflationary, or deflationary by design
Volatility	High (market-driven)	Low (designed for stability)	High (varies by type and use)
Technology Attributes	Blockchain-based; cryptographic security	Blockchain-based; usually tied to existing protocols	Blockchain-based; can include sidechains, smart contracts
Key Attributes	Scarcity, durability, "digital gold"	Proxy for stable value	Reaches beyond currency to many diverse functions within the DeFi ecosystem

PART 3

CONSIDERATIONS FOR PUBLIC PENSION SYSTEM INVESTMENT IN DIGITAL ASSETS

The perception of digital assets like Bitcoin and other cryptocurrencies has changed markedly among the investment community since the early 2010s as user adoption, technological advances, and regulatory frameworks governing digital assets have expanded and evolved. Large institutional investors, such as public pension funds, have begun a slow shift from skepticism to cautious adoption.

A January 2025 survey of over 350 institutional investors by EY-Parthenon and Coinbase found that 83% of respondents planned to increase digital asset holdings in 2025, and 59% planned to allocate over 5% of their assets under management (AUM) to cryptocurrencies.[25] The primary drivers were strong investment performance expectations, interest in emerging technological innovation, and inflation hedging. The most popular investment vehicles

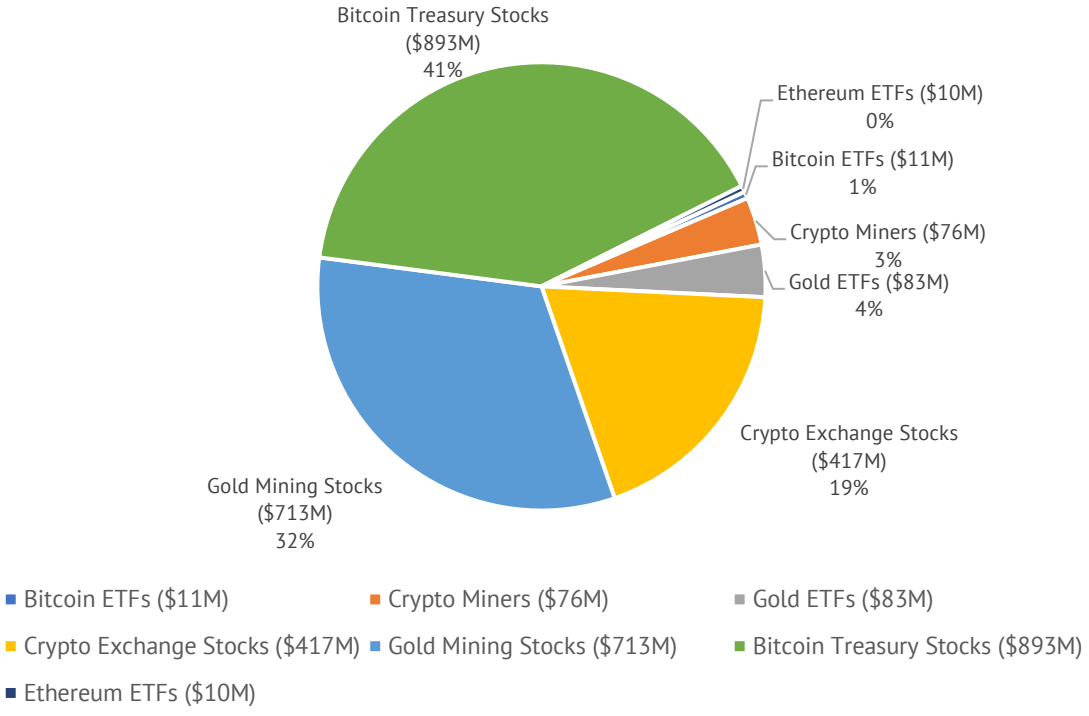
[25] Brett Tejpual et al., "Growing Enthusiasm Propels Digital Assets into the Mainstream: 2025 Institutional Investor Digital Assets Survey," EY Parthenon and Coinbase, 18 Mar. 2025. www.ey.com/content/dam/ey-unified-site/ey-com/en-us/insights/financial-services/documents/ey-growing-enthusiasm-propels-digital-assets-into-the-mainstream.pdf (Nov. 30 2025)

were spot crypto exchange-traded products (ETPs), investments in digital asset companies and funds, and stablecoins.

A white paper by a Marquette University professor analyzed Form 13F-HR filings for 17 of the largest U.S. public pension systems and found that, by mid-2025, these funds collectively reported $3.32 billion in crypto-linked equities and ETFs and $2.20 billion in precious-metal securities.[26] The author concludes that the scale of this investment suggests the allocation was intentional rather than incidental, given that these equities are part of major stock indexes.

The paper finds that pension funds overwhelmingly favored indirect exposure through publicly traded equity proxies—most notably MicroStrategy for Bitcoin exposure and large gold-mining companies for metals—rather than direct ETF holdings.

FIGURE 6: AGGREGATE CRYPTO OR PRECIOUS-METAL ALLOCATION BY ASSET CATEGORY



Source: David Krause, "An Analysis of U.S. Public Pension Fund Allocations to Cryptocurrency and Precious Metals."

[26] David Krause, "An Analysis of U.S. Public Pension Fund Allocations to Cryptocurrency and Precious Metals," Social Science Research Network (SSRN), 8 Nov. 2025. www.ssrn.com/abstract=5721583 (15 Dec. 2025).

Bitcoin treasury stocks—primarily MicroStrategy—represent the single largest category, accounting for roughly 42% of total combined crypto and precious-metal exposure. Gold mining equities and crypto exchange stocks (notably Coinbase) constitute the next two largest components. By contrast, direct crypto ETF exposure is minimal, with Bitcoin and Ethereum ETFs each representing well under 1% of total exposure.

This estimate only accounts for direct, reportable holdings. It does not include private equity and broader "picks-and-shovels" exposure—i.e., investments in public or private companies whose valuations depend on the growth of digital-asset markets, such as chip manufacturers, custody providers, mining firms, and other infrastructure businesses. Therefore, the true financial exposure of public pensions to the digital-asset ecosystem is significantly larger than what appears in 13F filings.

3.1 POTENTIAL BENEFITS OF INVESTMENT IN DIGITAL ASSETS

Public pension funds have attributes that make them unique among institutional investors, such as the constitutionally protected nature of pension benefits and the unique financial and fiduciary risks borne by taxpayers. Nonetheless, they tend to apply similar frameworks for evaluating investment opportunities and risks.

Public pensions and institutional investors tend to cite several motivations for their expanding interest in investing in digital assets:

- **Portfolio Diversification**

  Public pension portfolios are often heavily exposed to equities, fixed income, and illiquid alternative investments (e.g., private equity, venture capital, hedge funds) as they pursue challenging long-term return targets of around 7%. Adding a low-correlation asset such as Bitcoin, up to certain limits calibrated to risk tolerance, could help reduce overall portfolio volatility and provide diversification benefits that may otherwise be difficult to achieve in the current market environment.

- **Asymmetric Return Potential**

  Given their underfunded status, many public pensions seek investments that can meaningfully improve funded ratios. Bitcoin and certain other digital assets have, at times, delivered significant multi-year gains. An investment in BlackRock's Bitcoin ETF (IBIT) at its January 2024 launch would have doubled in worth at its peak within

the first year.[27] Even a small position, if timed favorably, could have an outsized positive effect on returns.

- **Inflation Hedge**

  With fixed supply and decentralized issuance, Bitcoin and other digital assets are sometimes viewed as a hedge against inflation similar to gold—something often called the "debasement trade,"[28] when investors turn to gold and Bitcoin to avoid or hedge the devaluation of fiat currencies, often a result of inflation, rising government debt, and geopolitical instability. For pension funds concerned about the erosion of real returns in a high-debt, inflationary environment, these assets can offer a hedge that is not directly correlated with other asset classes.

- **Exposure to Global Adoption**

  As covered in section 2.1, in many parts of the world where inflation is high, financial infrastructure is weak, civil and economic liberties are restricted, and the unbanked population is large, Bitcoin already functions as a medium of exchange and store of value. Exposure to digital assets offers public pensions indirect participation in a growing global financial network independent of any single government's monetary policy, spending habits, or fiscal trajectory.

- **Policy and Market Infrastructure Maturation**

  Regulatory actions such as the SEC's approval of spot Bitcoin ETFs and federal stablecoin reserve standards have improved institutional access, custody, and compliance frameworks. For public pensions that cannot or choose not to hold crypto directly, these developments enable participation through regulated, liquid vehicles that fit within existing operational capabilities.

3.2 POTENTIAL RISKS OF INVESTMENT IN DIGITAL ASSETS

While all asset classes carry different kinds of risks, cryptocurrencies introduce new and heightened risks for public pension systems that must be understood.

27 BlackRock iShares, "iShares Bitcoin Trust ETF (IBIT)," accessed 5 Dec. 2025. www.ishares.com/us/products/333011/ishares-bitcoin-trust-etf.

28 Yogita Khatri, "JPMorgan Says 'Debasement Trade' Is Here to Stay as Bitcoin and Gold Gain Structural Importance in Investor Portfolios," *The Block*, 4 Jan. 2025. www.theblock.co/post/333107/jpmorgan-debasement-trade-bitcoin-gold (4 Dec. 2025).

- **Price Risk**

  Price and timing can matter as much as the directionality for returns. For example, an investor who bought the Nasdaq index at its March 2000 dot-com peak—when valuations for companies like Google and Facebook's early predecessors were most inflated—would have taken 15 years to break even.[29]

  All-time highs and regulatory liberalization lead to high retail enthusiasm ("hot" markets), which can elevate the risk of overpaying for the asset and prolong recovery periods. When Crypto is "hot," it might not be the best time to invest. Poor entry timing can lock in underperformance for years, widening funding gaps.

- **Volatility Risk**

  Cryptocurrencies tend to exhibit significantly higher short-term and cyclical volatility than equities, bonds, or even gold. For public pensions, such volatility can materially affect reported asset values at actuarial valuation dates, increasing the risk of sudden spikes in contributions for state and local governments.

- **Coin-Specific Investment Risk**

  Unlike corporations, cryptocurrencies have no management team, balance sheet, or acquisition strategy to defend market share. Governance is decentralized, and protocol upgrades require community consensus, which can be slow or contentious. Even crypto network effects can be displaced if a more efficient or secure competitor emerges—potentially rendering any of these assets obsolete.

- **Recovery Risk**

  Most cryptocurrencies have no book value or liquidatable underlying assets. In the event of collapse, recovery rates can approach zero—unlike companies, which often have some salvageable assets that can be sold, which limits the losses of equity holders in case of bankruptcy.

- **Security Risk**

  In the U.K., a man accidentally discarded a hard drive containing private keys to 8,000 BTC—now worth hundreds of millions of dollars—leaving them permanently inaccessible in a landfill.[30] This illustrates a unique feature of cryptocurrency: the

[29] James Berman, "NASDAQ: The 15-Year Roundtrip," blog post, The Berman Value Folio, *Forbes*, 1 June 2015. www.forbes.com/newsletters/the-berman-value-folio/2015/06/01/nasdaq-the-15-year-roundtrip/ (8 Dec. 2025).

[30] Issy Ronald, "Man Who Lost $800 Million Bitcoin in Landfill Wants to Buy the Garbage Dump," CNN.com, 14 Feb. 2025. www.cnn.com/2025/02/14/uk/james-howells-landfill-bitcoin-gbr-intl-scl (22 Dec. 2025).

loss or compromise of private keys means the loss of the asset itself. For public pensions, similar risks can arise through custodial failures, exchange hacks, or internal operational errors, any of which could result in the irreversible loss of funds. Advances in quantum computing could also undermine current cryptographic protections, exposing wallets to theft.

- **Legal and Regulatory Risk**

  Domestic and international legal frameworks for digital assets are still in their early stages of development. While the Trump administration and the SEC have recently taken significant steps to expand institutional access to crypto, these policies can be reversed or reshaped by changes in political leadership, court decisions, or macroeconomic conditions. Shifts in regulation—such as reclassification of assets, trading restrictions, or new capital requirements—and taxation could impair liquidity, alter compliance obligations, or force divestment.

  Additionally, Bitcoin mining's high energy consumption has attracted political and public scrutiny, especially in jurisdictions with aggressive carbon-reduction targets. In some states, ESG-driven investment restrictions, legislative mandates, or shifting public opinion could limit investment options, reduce market access, or create reputational risk for public pensions. These pressures may be amplified if energy demand from AI data centers and other high-intensity industries further heightens the policy focus on electricity usage.

- **Rebalancing Risk**

  Public pensions operate with relatively strict asset allocations and must rebalance on periodic, rule-based schedules. The structure of digital-asset markets, with 24/7 trading, high volatility, and fragmented liquidity, amplifies the inherent risks of this process. The strict rebalancing requirements of public pensions can force them to buy or sell at unfavorable times, such as having to buy into momentum during rallies or sell during drawdowns.

  The public and predictable nature of pension rebalancing creates an additional vulnerability: opportunistic traders can anticipate scheduled flows and "front-run" these trades, moving prices before the pension transacts, increasing slippage, and forcing pensions to accept unfavorable prices.[31]

[31] Campbell R. Harvey, "Rebalancing's Hidden Cost: How Predictable Trades Cost Pension Funds Billions," blog post, Enterprising Investor, CFA Institute, 10 Apr. 2025. www.blogs.cfainstitute.org/investor/2025/04/10/rebalancings-hidden-cost-how-predictable-trades-cost-pension-funds-billions/ (18 Nov. 2025).

3.3 COMPARING BITCOIN AND GOLD

The role that crypto aspires to play in investment portfolios is not without precedent. There are documented instances of U.S. public pension systems holding gold—typically as part of a broader precious metals allocation within their alternatives portfolio. For example, since 2020, Ohio's Police & Fire Pension Fund has maintained a target allocation to gold equal to 5% of its portfolio.[32]

For centuries, gold has been held by individuals, institutions, and governments as a store of value, a hedge against inflation and fiscal risk, and a form of currency independent of any single nation or central bank. Bitcoin is unique among all digital assets in that it shares many of the same theoretical portfolio benefits as gold: it is scarce, non-yielding, and derives its value from broad market consensus rather than the cash flows of an operating business.

Key commonalities between Bitcoin and gold include:

- **Diversification Opportunities:** Gold often appreciates during periods of inflation or currency devaluation, offering low correlation with equities and bonds and reducing overall portfolio volatility. Bitcoin can exhibit similar diversification properties.
- **Store of Value:** As a tangible asset with millennia of historical precedent, gold serves as a safe haven during geopolitical or financial turmoil, aiding long-term preservation of pension capital. Despite having only years, not millennia, of history, Bitcoin proponents and most of the investment community commonly refer to Bitcoin as "digital gold," offering a similar store of value.
- **Inflation Hedge:** Gold's finite supply and independence from government-issued currency have historically enabled it to retain purchasing power during prolonged periods of inflation. Bitcoin was designed with a similar scarcity mechanism, with a fixed cap of 21 million coins and a predictable issuance schedule.
- **Potential for Strong Returns:** While non-yielding, both assets can have significant capital appreciation in favorable market conditions, driven by shifts in investor demand or macroeconomic sentiment.

Just as they share similar potential benefits, Bitcoin and gold share similar risks:

[32] Ohio Police & Fire Pension Fund, "2024 Annual Comprehensive Financial Report," 10 July 2025. www.op-f.org/Files/AnnualComprehensiveFinancialReport2024.pdf (18 Nov. 2025).

- **High Volatility and Lack of Yield:** Prices can fluctuate sharply with no dividend or interest income, creating opportunity costs during flat or declining markets.
- **Market Risk:** Given that neither asset has cash flow or other underlying assets influencing its valuation, both assets rely on market consensus of value, making them especially vulnerable to shifts in sentiment.

  For example, even if changes in circumstances cause the market to become pessimistic about a specific company, its book value—the value of its underlying assets, such as buildings, land, and cash reserves—offers reassurance and helps "cap" devaluation. Bitcoin and most cryptocurrencies (notably, not stablecoins) do not have that.
- **Operating Costs:** Physical gold requires secure storage and insurance, while Bitcoin needs strong custody and cybersecurity, which may introduce management fees or counterparty risks.

However, while Bitcoin shares many of gold's characteristics, it also offers unique benefits and risks that set it apart from traditional assets.

Key differences between Bitcoin and gold include:

- **Physical Utility:** Unlike Bitcoin, gold has inherent uses that are independent of its market adoption or "network effect."

  A network effect occurs when an asset or technology becomes more valuable as more people use or hold it; Bitcoin's value, like that of most other digital assets, is almost entirely dependent on this dynamic.

  Gold, by contrast, has substantial non-monetary demand: it is used in electronics, dentistry, aerospace, and, most prominently, jewelry. It is estimated that most of the annual gold demand is tied to its physical utility.[33] Its consistent industrial/physical uses give it a price support and volatility stabilization that crypto lacks.

  However, emerging payment technologies built on top of the Bitcoin network, such as the Lightning Network and other Layer-2 applications, suggest the potential for technological and infrastructural value beyond Bitcoin's role as a currency.

[33] World Gold Council, "Gold Breaks Records as Investors Seek Shelter From Market Turbulence," press release, 30 Oct. 2025. www.gold.org/news-and-events/press-releases/gold-breaks-records-investors-seek-shelter-market-turbulence (25 Nov. 2025).

- **Market Maturity:** Gold is fully integrated into global financial systems, with established markets, regulatory frameworks, and deep liquidity. It trades across physical, futures, and ETF markets with relatively stable bid-ask spreads and robust custody infrastructure. Bitcoin remains in an early phase of institutional adoption, with evolving regulation, more volatile liquidity conditions, and operational risks that gold markets largely resolved decades ago.
- **Cultural and Historical Demand:** Gold's status as a store of value spans thousands of years and is deeply embedded in cultural traditions. It plays a central role in weddings, festivals, and religious ceremonies—particularly in India and China, which together account for over half of global jewelry consumption.[34]

  By contrast, the entire history of Bitcoin—from the original concept white paper in 2009, to the approval of Bitcoin ETFs, to the U.S. House's passage of the CLARITY Act—has occurred in less than 20 years. Culturally reinforced demand supports gold prices even in periods when it might not be traditionally attractive, such as during prolonged equity bull markets or periods of low inflation.
- **Elastic Supply:** Gold's total physical stock on Earth is finite, but its economically recoverable supply is not fixed. What governs the market supply of gold is the costs and benefits of extraction, not geological limits. Therefore, gold's supply is economically *elastic*: As prices rise, lower-grade ore becomes viable, dormant mines reopen, and exploration expands—undermining long-run price appreciation.

  Bitcoin's supply is mechanically *inelastic*. Not only is its total supply permanently capped at 21 million, but the rate of new issuance is also fixed.[35] Higher prices attract more miners, but they do not increase the quantity of new Bitcoin produced. As a result, demand shocks cannot be absorbed through higher output and instead translate almost entirely into price volatility. This rigid supply rule is precisely what gives Bitcoin its credibility as a long-term store-of-value asset, since holders face no risk of supply dilution in response to rising demand.

[34] World Gold Council, "Gold Demand Sectors." www.gold.org/about-gold/gold-demand/by-sector (10 Nov. 2025).

[35] Daniel Gray, "Understanding the Bitcoin Halving," Fidelity Digital Assets, 27 June 2023 www.fidelitydigitalassets.com/research-and-insights/understanding-bitcoin-halving (5 Dec. 2025).

PART 4

HOW ARE PUBLIC PENSIONS INVESTING IN DIGITAL ASSETS?

Public pension systems can gain exposure to cryptocurrencies and digital assets through three broad categories of strategies:

- **Direct Exposure**: Holding the cryptocurrency itself or a vehicle that closely tracks its price.
- **Indirect Exposure:** Holding securities of companies whose performance is significantly tied to cryptocurrency markets.
- **Infrastructure / "Picks and Shovels" Exposure**: Investing in the underlying technology, infrastructure, and service providers that enable the cryptocurrency ecosystem.

Each investment category and its associated benefits and risks are summarized in the following sections, and the Appendix provides more-detailed information on these strategies.

4.1 DIRECT EXPOSURE

Direct holding refers to the direct acquisition of digital assets like Bitcoin. Approaches vary in liquidity, counterparty risk, and operational complexity:

- **Direct Spot Purchases:** While still rare among U.S. public pension funds, large institutional investors can make large, direct purchases of digital assets like Bitcoin and Ethereum directly via regulated exchanges. Once a trade is executed, institutions face two distinct custody paths:
    - **Exchange-custodied holding:** If assets remain on the exchange after purchase, they are held in custodial accounts controlled by the exchange or its affiliated custodian. This structure provides immediate liquidity and operational convenience but exposes the investor to counterparty, operational, and cybersecurity risk, as demonstrated by exchange failures such as FTX.
    - **Off-exchange custody:** Assets may be promptly withdrawn from the exchange and transferred either to:

      Self-custody ("cold storage"), where private keys are held entirely offline (e.g., hardware or paper wallets). This substantially reduces counterparty and custodial risk but introduces significant operational, governance, audit, and key-management challenges for public funds; or

      Dedicated institutional custodians, such as Fidelity Digital Assets or Anchorage Digital Bank,[36] which offer segregated accounts, cold-wallet storage, SOC-audited controls, and customizable governance frameworks (e.g., multi-signature approval, role-based access). These arrangements are designed to meet fiduciary and reporting requirements but still entail counterparty risk and additional fees.
- **Spot ETFs:** SEC-approved spot Bitcoin (and increasingly Ethereum) ETFs (e.g., iShares Bitcoin Trust, IBIT) hold the underlying asset with regulated custodians and issue exchange-traded shares. These vehicles provide full price exposure with exchange liquidity, audited reserves, and substantially lower operational complexity than direct custody. However, they introduce the usual small ETF risks, such as tracking error fee drag, and overall limit direct control over the underlying asset.

[36] Anchorage Digital, "Custody." www.anchorage.com/platform/custody (20 Nov. 2025).

- **Derivatives (e.g., futures contracts):** Synthetic exposure without holding the underlying asset. These may allow tactical positioning but introduce rollover costs and leverage risk.

4.1.1 POTENTIAL BENEFITS, RISKS, AND INVESTMENT RATIONALE

Potential Benefits: Potential benefits for institutional investors through the direct holding of digital assets include:

- Highest fidelity to cryptocurrency price movements.
- Potential for outsized gains if timed well, even with small allocations.
- Greater portfolio diversification than equity proxies.

Potential Risks: Potential risks for institutional investors through the direct holding of digital assets include:

- High volatility and drawdown potential.
- Must accept either complex operational risk or counterparty risk.
- No underlying cash flows; returns depend solely on market price appreciation.

Potential Rationale for Public Pension System Investment: Factors that may help drive interest in direct holdings of digital assets by public pension systems include:

- Belief in cryptocurrency's long-term adoption and scarcity value.
- Desire for pure exposure rather than correlated equity substitutes.
- Willingness to accept volatility in exchange for asymmetric upside.

4.2 INDIRECT EXPOSURE

Indirect holding refers to owning companies or securities whose value is heavily linked to cryptocurrency prices or transaction volumes. Today, there are two primary investment approaches for institutional investors interested in indirect holdings of digital assets:

- **Shares of Bitcoin treasury companies:** Companies such as MicroStrategy, which hold significant cryptocurrency reserves.
- **Shares of crypto-related companies:** Cryptocurrency exchanges (Coinbase), miners (Riot Platforms, Marathon Digital), and payment platforms.

4.2.1 POTENTIAL BENEFITS, RISKS, AND INVESTMENT RATIONALE

Potential Benefits: Potential benefits for institutional investors through indirect holdings of digital assets include:

- Exposure through familiar equity structures with established financial reporting, governance, and liquidity.
- Potential for equity market upside beyond cryptocurrency movements.
- Avoid operational complexity of direct holdings.

Potential Risks: Potential risks for institutional investors through indirect holdings of digital assets include:

- Equity risk factors can dilute the correlation to cryptocurrency performance.
- Company-specific risks: management decisions, regulatory actions, competitive pressures.
- In some cases (e.g., MicroStrategy), the stock may behave like a leveraged crypto position, amplifying volatility.

Potential Rationale for Public Pension System Investment: Several considerations could prompt public pension systems to seek greater exposure to indirect digital asset holdings, including:

- Comfort with publicly listed securities over digital asset custody.
- Ability to integrate exposure into existing equity allocation targets.
- Preference for regulated, audited investment vehicles.

4.3 ADJACENT INVESTMENTS: PICKS AND SHOVELS

The “picks and shovels” term comes from an anecdote from the California Gold Rush, where the most reliable profits came not from mining gold itself but from selling essential tools to miners—like picks and shovels. In this context, the “miners” are cryptocurrency networks and users, and the “picks and shovels” are energy, chips/hardware, and other inputs in the blockchain infrastructure.

Many of these assets also serve adjacent high-growth sectors such as artificial intelligence, cloud computing, and fintech. This cross-sector utility can reduce crypto-specific risk and provide upside even if digital asset prices stagnate or fall.

Common vehicles for institutional investor investment in "picks and shovels" related to digital assets and decentralized finance (DeFi) include:

- **Mining equipment/chip manufacturers:** Producers of specialized chips and hardware used for proof-of-work networks.
- **Blockchain infrastructure providers:** Firms offering scalability, interoperability, and enterprise blockchain solutions.
- **Custody, payment, and compliance platforms:** Regulated entities enabling secure asset storage, transaction processing, and AML (anti-money laundering)/KYC (know-your-customer) compliance.
- **Private equity/venture capital:** Investments in private venture blockchain technology companies, custody services, payment systems, or DeFi platforms.

4.3.1 POTENTIAL BENEFITS, RISKS, AND INVESTMENT RATIONALE

Potential Benefits: Benefits for institutional investors through the investment in digital asset "picks and shovels" firms include:

- Potential to benefit from long-term cryptocurrency adoption while reducing direct exposure to price volatility.
- Hedging crypto-specific risk by getting broader exposure to technology growth (e.g., AI, fintech) using similar infrastructure.

Potential Risks: Despite being related to the emergent digital asset sector, the potential risks to institutional investors associated with digital asset-related "picks and shovels" are not dissimilar from the normal types of risks associated with public equity and private market investments more broadly, including:

- If done through private equity/venture capital funds, the investment is likely to be illiquid, carry valuation risk, and entail very high management fees.
- Upside may still be heavily dependent on the health of the crypto sector, even for companies with diversified revenue streams.

Potential Rationale for Public Pension System Investment: Factors that could motivate public pension systems to seek greater exposure to digital asset "picks and shovels" include:

- Seeking strategic exposure to blockchain growth without full crypto price risk, while capturing AI upside.
- Potential for returns across multiple scenarios, including those where crypto prices stagnate while blockchain technology adoption grows in enterprise or adjacent sectors.

PART 5

BEST PRACTICES

Digital assets like Bitcoin and Ethereum represent an emerging financial technology and asset class. While investment in digital assets offers potential upside in returns and hedging properties, it also introduces significant investment, volatility, and political risks that public trusts like pension systems need to weigh carefully. Regulatory, tax, and national-security stances remain fluid, and shifts can affect market access, custody rules, and public perception—exposing pension allocations to legislative or oversight pushback.

Almost all unfunded liabilities in U.S. public pension systems are ultimately backstopped by taxpayers. If there is interest in investing in cryptocurrencies or digital assets, it is important for pensions to apply a distinct set of best practices to guide investment in digital assets such as Bitcoin. This section provides guidance for determining such a set of best practices.

5.1 PRINCIPLES OF A RESPONSIBLE DIGITAL ASSET INVESTMENT FRAMEWORK

Public pension systems differ widely in structure, liabilities, and investment objectives, so there is no one-size-fits-all solution. While adoption of digital assets is at an all-time high and the sector is maturing rapidly, experts remain divided; many have raised serious concerns about the risks of crypto in pensions, while others highlight its potential as an emerging asset class.

With not just Congress and the Trump administration, but also many state legislatures recently advancing crypto-related measures,[37] we propose an eight-part framework for evaluating how digital assets might fit within pension portfolios. Any state or local government policy related to pension or other public trust investment in digital assets should consider these factors:

1. Fiduciary Duty

Crypto allocations must serve the exclusive purpose of meeting constitutionally protected pension obligations, not advancing political, technological, or ideological goals. Any investment decision should demonstrate that the expected risk-adjusted return profile exceeds or complements existing alternatives after accounting for volatility, liquidity, and operational risks.

2. Portfolio Risk Consistency

Any crypto allocation—whether direct holdings, ETPs, or indirect exposure—should aspire to displace an equivalent portion of existing alternative investments (e.g., private equity, hedge funds) to at least maintain the portfolio's overall risk exposure, which is already high by historical and global standards. Crypto should not increase aggregate portfolio volatility beyond the plan's established tolerance.

3. Allocation Limits

Total allocation to digital assets (direct and some indirect holdings) should be capped—e.g., limited to no more than 2%–10% of total plan AUM, either by law or investment boards.

The exact allocation should be aligned with prevailing market guidance. BlackRock suggests a 1%–2% Bitcoin allocation for diversified portfolios;[38] while Bank of America Private Bank advises 1%–4% for clients with elevated risk tolerance.[39] Fidelity generally frames 2%–5% as a reasonable upper range for investors who choose to allocate to

[37] National Conference of State Legislatures, "Cryptocurrency, Digital or Virtual Currency and Digital Assets 2025 Legislation," updated 11 Sept. 2025. www.ncsl.org/financial-services/cryptocurrency-digital-or-virtual-currency-and-digital-assets-2025-legislation (10 Dec. 2025).

[38] Samara Cohen et al., "Sizing Bitcoin in Portfolios," BlackRock.com, December 2024. www.blackrock.com/ch/professionals/en/insights/portfolio-design/sizing-bitcoin-in-portfolios (5 Dec. 2025).

[39] David Hollerith, "Bank of America Says Its Wealth Management Clients May Put Up to 4% of Their Portfolio in Crypto," *Yahoo Finance*, 1 Dec. 2025. www.finance.yahoo.com/news/bank-of-america-says-its-wealth-management-clients-may-put-up-to-4-of-their-portfolio-in-crypto-220028738.html (5 Dec. 2025).

Bitcoin.[40] By contrast, Spain's BBVA is advising high-net-worth clients to consider up to 7% exposure to digital assets.[41]

For purposes of enforcing allocation limits, exposure should include crypto-proxy equities and vehicles that function primarily as Bitcoin wrappers—such as MicroStrategy and similar majority-crypto treasury companies—as well as direct Bitcoin and crypto ETF holdings. Otherwise, funds could formally evade statutory limits while retaining the same underlying economic exposure. Any security whose valuation is overwhelmingly driven by crypto price movements should be treated as digital-asset exposure for risk, reporting, and compliance purposes.

A number of state legislatures already impose legal restrictions on the share of a public pension portfolio that can be invested in different asset classes (e.g., private equity), so it would not be inconsistent to apply a similar limit to investment in digital assets and cryptocurrencies.

4. Due Diligence

Pension systems must conduct enhanced due diligence for any crypto-related fund or counterparty, assessing custody arrangements, regulatory compliance, counterparty risk, audit quality, and disaster recovery procedures. Elected private managers must have a demonstrable track record in institutional risk controls, not just crypto market returns.

5. Transparency and Reporting

While certain securities must be reported in SEC Form 13F filings by public pensions with over $100 million in qualifying assets, accessible and timely disclosure should go further. All crypto-related holdings, direct or indirect, should be disclosed in quarterly or annual public reports, including position size, vehicle type, strategy, valuation method, and custodian. Disclosures of commitments to private equity or venture capital funds with crypto exposure should also include committed capital, funded capital, and top underlying holdings, to ensure that beneficiaries, policymakers, and researchers have complete visibility into both public and private market exposures.

40 Timmer et al., "The Case for Bitcoin."

41 Cointelegraph, "Spanish Bank BBVA Suggests Clients Make 7% Crypto Allocation," Coinglass.com, 18 June 2025. www.coinglass.com/news/495280 (8 Nov. 2025).

6. Stress Testing

Plans should incorporate crypto-specific stress scenarios (e.g., 80% drawdown, exchange collapse, prolonged regulatory ban) into their risk models. Results should be presented to boards and included in public investment risk disclosures.

7. Rebalancing

If a public pension fund deems Bitcoin, stablecoins, or other digital assets appropriate for its portfolio, any allocation should merit periodic readjustments of overall allocation in such a way as to maintain the fund's overall risk profile. And if a legal or policy limitation on the share of a pension portfolio invested in digital assets is imposed (e.g., a 2%–10% limit), it is important to specify the frequency with which rebalancing should occur, given that a rapid run-up in digital asset values could easily create a situation where portfolio share exceeds the imposed limit. Some entities may choose an annual rebalancing, for example, while others may prefer more-frequent rebalancing; regardless, the policy should be clearly stated.

8. Exit Strategy

Each crypto allocation should have pre-defined triggers for reduction or liquidation, including breach of risk limits, loss of key custody infrastructure, or material regulatory changes.

5.2 BEST PRACTICES FOR DIRECT DIGITAL ASSET EXPOSURE

Direct cryptocurrency exposure represents the highest-risk form of digital asset exposure for public pension funds. These assets are subject to extreme volatility, custodial challenges, and evolving regulatory treatment. Given their unique risk profile, pension systems should adhere to enhanced safeguards before, during, and after making such allocations.

5.2.1 DIGITAL ASSET INVESTMENTS

Allocation:

- Create a "Digital Asset" asset class, with its allocation sourced from the current share of assets allocated to alternative assets.
- Cap exposure to a small share of total assets. There is no consensus yet on what limits should be, but based on some of the early market analysis, the following limitations are a reasonable starting point:

    - For Bitcoin, up to 5% of total assets under management
    - For other digital assets, up to 2% of total assets under management
- While some states choose to codify allocation limits in statute, it is equally important that the investment policy statement (IPS) and the authorizing law preserve sufficient flexibility. Asset classes are volatile, and plans need the ability to rebalance as market conditions, funding status, and risk tolerance shift.

Investment Vehicles:

- For complete crypto exposure, prioritize well-regulated products that remove operational hurdles while preserving market exposure, such as:
    - **Spot Bitcoin ETFs** are SEC-approved vehicles for liquidity, custody safeguards, and compliance, analogous to gold ETF structures.
    - **Bitcoin treasury companies and crypto industry equities** offer hybrid equity/alternative asset risk-return characteristics.
- Apply heightened due diligence to futures or derivative-based products to minimize leverage and rollover risk.

Operational and Counterparty Risk Management:

- Stress test pension systems annually for solvency, volatility, liquidity, and market collapse.
- Monitor emerging risks, such as quantum computing threats to cryptographic security.
- Track National Institute of Standards and Technology guidance and protocol upgrades (e.g., post-quantum encryption).
- Actively monitor and manage custodial and counterparty relationships.

Governance and Oversight:

- Formal board authorization and policy adoption must precede any digital-asset investment. The board should explicitly amend the IPS to define the permissible asset types, allocation limits, approved vehicles, risk controls, custody standards, and reporting requirements specific to digital assets.
- Publish a quarterly or annual Digital Assets Transparency Report disclosing all direct and indirect exposure, including: custodian, position size, vehicle type, valuation methodology, performance, and material risk factors.
- Maintain a predefined exit and wind-down strategy to enable orderly liquidation in response to adverse market events, custodial failures, regulatory changes, or funding needs.

5.2.2 REBALANCING

Given the high volatility of cryptocurrencies, direct holdings can cause portfolio allocations to drift significantly and frequently. This can lead to excessive trading, operational burden, and potential performance drag as pensions try to keep a volatile asset within a predetermined allocation range. To the extent that a pension system may be operating within a legal or regulatory cap on digital assets' share of the total portfolio, the approach and method of rebalancing are important considerations. Rebalancing options include:

Flexible Allocations:

- Codify provisions that allow temporary deviations from target allocations to avoid forced trading in response to short-term price movements. This can be implemented through:
    - **Explicit drift bands** around the target allocation (e.g., ±2 percentage points around a 3% Bitcoin target), or
    - **A dual-threshold structure**, with one cap for initial allocation (e.g., 2%) and a higher cap for maximum allowable appreciation (e.g., 5%).
- Rebalance only when holdings breach these predefined bands, rather than on a fixed calendar schedule. This reduces unnecessary turnover, minimizes market-impact costs, and lowers operational friction.

Continuous Rebalancing:

- Favor preemptive and opportunistic rebalancing over strictly periodic schedules (e.g., monthly or quarterly) to avoid predictable trading patterns that other market participants could anticipate and exploit (see "Rebalancing Risk" in Section 3.2).
- Monitor exposures continuously and preemptively adjust positions when:
    - Allocation bands are approached or breached,
    - Market dislocations materially alter risk–return tradeoffs (e.g., federal interest rate changes), and
    - Liquidity conditions improve execution quality.

5.2.3 STABLECOINS

Currency-tied stablecoins like USDC (Circle) and USDT (Tether) can be a more efficient way to invest in traditional asset classes, such as U.S. Treasuries. However, they expose public pensions to new counterparty risks. Best practices must be applied on a case-by-case basis.

Allocation:

- Consider classifying suitable fully backed, regulated stablecoins within the portfolio's cash equivalents or short-duration fixed-income allocation, rather than as speculative alternatives.
- Limit aggregate stablecoin exposure to a small percentage of total plan assets (e.g., <2%), unless directly offset by reductions in other cash-equivalent holdings.
- Treat stablecoin positions as tactical liquidity instruments, not as structural return drivers.

Investment Vehicles:

- Restrict exposure to only regulated, fully asset-backed stablecoins collateralized by real reserves of short-term U.S. Treasuries, international Treasuries, insured bank deposits, or other traditional assets.
- Prioritize issuers under U.S. regulatory oversight that file periodic reports, third-party attestations, and make real-time reserve transparency accessible.
- Avoid algorithmic or undercollateralized stablecoins due to their elevated risk profile, as they carry significantly higher counterparty risk and depend more on market confidence.

Risk Management:

- Conduct quarterly verification of reserve composition, maturity profile, and liquidity of underlying assets.
- Implement counterparty and custody risk controls to ensure issuer reserves are held by reputable, regulated custodians.
- Monitor legal and regulatory developments affecting reserve composition and redemption rights; prepare contingency plans for issuer-specific disruptions.

5.3 BEST PRACTICES FOR CRYPTO-RELATED PUBLIC EQUITY INVESTMENTS

Publicly traded companies like Coinbase (COIN) or MicroStrategy (MSTR) offer pensions a way to gain indirect exposure to digital assets without directly holding cryptocurrencies. However, these equities are highly sensitive to crypto market cycles and regulatory developments, and their volatility often exceeds that of the underlying assets.

1. DIGITAL ASSET TREASURIES:

- Digital asset treasury companies, such as MicroStrategy and Strike, lie within a "Digital Assets" or "Alternative Equity" allocation rather than the standard "Public Equity," ensuring that total exposure, when combined with other cryptocurrency holdings, remains within the predetermined range.
- Recognize that a Bitcoin treasury company's valuation is currently heavily tied to its leveraged Bitcoin holdings rather than its core software business, and stress-test for Bitcoin drawdowns accordingly.

2. INDIRECT INVESTMENTS:

- When investing in companies partially serving the cryptocurrency ecosystem, diversify across multiple sub-sectors (e.g., exchanges, infrastructure, payment platforms) to reduce the concentration of risk.
- Conduct fundamental analysis of each company's core business model, revenue drivers, regulatory exposure, and correlation to underlying crypto assets.
- Scrutinize governance, audit quality, and compliance with applicable securities and financial regulations.

3. DISCLOSURE:

- Public pensions subject to SEC Form 13F reporting must already disclose certain public equity holdings quarterly via the federal government's EDGAR system. However, some large state and local pensions—particularly those investing through separate accounts or smaller plan sizes—are not subject to 13F requirements. Regardless of legal obligation, all public pension systems should voluntarily disclose their public equity holdings—including crypto-related equities—in a standardized format similar to 13F filings.
- These voluntary disclosures should be easily accessible to the public, include position sizes, market values, and portfolio percentages, and be updated at least quarterly to ensure stakeholders and researchers have full visibility into crypto-related exposures.

5.4 BEST PRACTICES FOR CRYPTO-RELATED PRIVATE EQUITY INVESTMENTS

Private equity (PE) and venture capital (VC) funds targeting blockchain, cryptocurrency infrastructure, and digital asset markets can offer high return potential but also come with heightened costs and risks—such as illiquidity, valuation opacity, and leverage risk. Public pensions must treat crypto-related PE/VC with the same, or greater, caution applied to other alternative investments.

1. ALLOCATION:

- Classify all crypto-related PE/VC under the "alternative investments" allocation, or under a dedicated "digital assets" subcategory if the investment thesis is primarily dependent on digital asset market performance.
- Avoid over-concentration by diversifying across multiple fund managers, vintages, and sub-sectors (e.g., infrastructure, payments, custody, DeFi platforms).

2. MANAGER SELECTION:

- Apply heightened due diligence to funds investing in pre-revenue blockchain startups or token-based projects, given the elevated risk of failure, fraud, or abrupt project abandonment ("rug pulls") at this stage.
- Require managers to have a verifiable track record in both blockchain investments and traditional PE/VC risk management.
- Given this is an emerging field, conduct enhanced due diligence on fund structure, fee arrangements, key-person risk, governance practices, and conflicts of interest.
- Scrutinize valuation methodologies for digital assets and require independent audits of fund holdings.

3. TRANSPARENCY AND REPORTING:

- Publicly disclose the names of all crypto-related PE/VC funds, committed and deployed capital, and net asset value (NAV) at least annually and preferably quarterly.
- Consider disclosure of all management fees, performance fees, and fund expenses in both dollar and percentage terms.

4. LIQUIDITY AND EXIT STRATEGY:

- Assess each fund's liquidity profile against the pension's cash flow needs; ensure commitments do not constrain the plan's ability to meet benefit payments.
- Negotiate contractual provisions allowing for early exit or transfer of interests if regulatory, technological, or market conditions materially alter the fund's viability.

PART 6

CONCLUSION

U.S. public pension systems collectively hold over $1.5 trillion in unfunded liabilities, prompting many to increase exposure to higher-risk, less-liquid asset classes to catch up on missed return targets over the past 20 years. Against this backdrop, digital assets like Bitcoin, regulated stablecoins, and crypto-related equities have emerged as a new investment frontier, but one that presents a new and complex set of risk considerations for elected officials and fiduciaries. This report offers an early-stage framework for public pensions to evaluate whether digital assets can play a meaningful role within their portfolios.

The appeal of digital assets to institutional investors like public pensions is clear: they offer portfolio diversification, potential for asymmetric returns that could significantly improve funded ratios, and, in the case of Bitcoin, inflation-hedge properties. However, these benefits are paired with several risks, including extreme short-term volatility, unique custodial security risks, and the still-evolving legal and regulatory landscape. Furthermore, unlike traditional assets, most cryptocurrencies lack underlying cash flows, making them especially vulnerable to shifts in market sentiment and greatly increasing the risk of recovery in the event of collapse.

Ultimately, the decision to invest in digital assets should be backed by rigorous due diligence and strict fiduciary duty. For any public pension system, exposure must be transparent and consistent with the primary obligations to beneficiaries and taxpayers. The core principles recommended in this report form a roadmap to help evaluate and execute a

prudent digital assets investment policy, including conservative allocation limits, periodic rebalancing, robust stress testing, and clear, predefined exit strategies. By adhering to this structure, public pension systems can cautiously explore the next evolution of finance while ensuring any exposure to this emerging asset class remains a calculated, well-managed risk that is in line with the unique obligations public pensions impose on government budgets and taxpayers.

APPENDIX: CURRENT LANDSCAPE OF PUBLIC PENSION FUND INVESTMENT IN DIGITAL ASSETS

Public pensions in the United States have so far concentrated their cryptocurrency exposure in two primary ways: initially through direct holdings—such as spot Bitcoin ETFs—and increasingly through indirect exposure via publicly traded Bitcoin proxy companies (notably MicroStrategy) and private equity or venture capital funds targeting blockchain-related businesses.

In recent years, many of these private market allocations have followed a "picks and shovels" strategy, investing in the infrastructure, technology, and service providers that enable cryptocurrency markets. This approach often targets assets—such as data centers, high-performance chips, and cloud platforms—that can be repurposed for adjacent high-growth sectors, such as artificial intelligence, reducing crypto-specific risk while expanding potential upside. However, these strategies still carry the illiquidity, valuation opacity, and sector-dependence risks inherent in private markets.

The following sections outline some of the most notable investments by public pensions in cryptocurrencies, following the structure outlined in PART 4 How Are Public Pensions Investing in Digital Assets?

1. Direct investment in digital assets by public pension funds
2. Indirect investment in digital assets by public pension funds
3. "Pick and shovels" digital asset investments by public pension funds

1. DIRECT INVESTMENT IN DIGITAL ASSETS BY PUBLIC PENSION FUNDS

BITCOIN ETFS

Spot Bitcoin exchange-traded funds (ETFs) are SEC-approved investment vehicles that hold actual Bitcoin with a regulated custodian. They trade on public exchanges like stocks, giving investors price exposure without the operational complexities of owning Bitcoin directly (e.g., private key storage). This makes them the simplest, most regulated form of direct Bitcoin exposure available to public pensions.

Public Pension Investment Cases

Michigan State Retirement System (MSRS):
In July 2024, MSRS disclosed an investment of approximately $6.6 million in the ARK 21Shares Bitcoin ETF (ARKB), according to SEC 13F filings. By mid-2025, the system had increased its holdings to roughly 300,000 shares, valued at approximately $11.4 million, while also maintaining exposure to Ethereum-related trusts—bringing its total reported digital-asset exposure to $27 million. As of mid-2025, MSRS appears to be the only large U.S. public pension system with an active spot Bitcoin ETF position.

State of Wisconsin Investment Board (SWIB):
SWIB was among the first U.S. public pension funds to invest in spot Bitcoin ETFs following their approval in January 2024. The fund initially purchased approximately $99 million of iShares Bitcoin Trust (IBIT) and $64 million of Grayscale Bitcoin Trust (GBTC).[42] At its peak,

[42] Mat Di Salvo, "Wisconsin State Holds $163 Million in BlackRock, Grayscale Bitcoin ETF Shares," *Decrypt*, 14 May 2024. www.decrypt.co/230619/wisconsin-state-163-million-blackrock-grayscale-bitcoin-etfs (22 Nov. 2025).

the combined position reportedly reached approximately $350 million[43]—about 0.2% of SWIB's $162+ billion portfolio. In May 2025, SWIB fully exited its IBIT holdings, though it still holds indirect exposure to the digital asset economy (including Coinbase and Strategy, see section 2 of Appendix).[44]

2. INDIRECT INVESTMENT IN DIGITAL ASSETS BY PUBLIC PENSION FUNDS

STRATEGY ($MSTR, FORMERLY MICROSTRATEGY)

Strategy Incorporated is a publicly traded business intelligence software company that, since 2020, has pursued a corporate strategy of using excess cash and debt issuance to acquire and hold Bitcoin as its primary treasury reserve asset.

TABLE A1: 10 LARGEST STRATEGY ($MSTR) HOLDINGS BY PUBLIC PENSION SYSTEMS, FY25, Q3

State	Fund	Value of $MSTR Holdings FY25 Q3
California	Public Employees Retirement System	$144.4M
California	California State Teachers Retirement System	$132.7M
New York	New York State Common Retirement Fund	$90.93M
Florida	State Board of Administration of Florida Retirement System	$77.3M
Wisconsin	State of Wisconsin Investment Board	$44.2M
Ohio	Municipal Retirement Fund	$34M
Arizona	Arizona State Retirement System	$24.6M
Texas	Teacher Retirement System of Texas	$23.7M
New Jersey	Police & Firemen's Retirement System of New Jersey	$13.7M
Utah	Utah Retirement Systems	$9.3M

Source: Fintel.io 13F filings; list of 10 public pension and retirement systems with the largest $MSTR positions as of Q3 2025 (Filed 5 Nov 2025).

[43] Vivian Nguyen, "Wisconsin Bitcoin Investment $321.5M," *CryptoBriefing*, 14 Feb. 2025. cryptobriefing.com/wisconsin-bitcoin-investment-321-5m (22 Nov. 2025).

[44] Brayden Lindrea, "Wisconsin Investment Board Sold Entire BlackRock Bitcoin ETF Stash," *Cointelegraph*, 15 May 2025. www.cointelegraph.com/news/wisconsin-investment-board-sold-entire-blackrock-bitcoin-etf-stash (22 Nov. 2025).

Its core software business now represents a small share of its market value, which is overwhelmingly driven by the size and value of its Bitcoin holdings. Since it continually issues debt and other capital to buy more Bitcoin, MSTR functions as a leveraged proxy for Bitcoin exposure—its share price typically moves more than Bitcoin itself, both up and down.

Strategy is also listed on the NASDAQ and included in major index products. This means some institutional exposure to MSTR—including by public pension funds—may be unintentional and purely mechanical, arising from passive index tracking of the NASDAQ index rather than an active decision to gain leveraged exposure to Bitcoin.

Coinbase

Coinbase Global, Inc. is the largest U.S.-regulated cryptocurrency exchange and a Fortune 500 company. It operates a digital trading platform for buying, selling, and storing cryptocurrencies, and also offers custody, staking, and payment solutions for institutional clients.

Since Coinbase is a public company listed on NASDAQ, any pension system that allocates passively through index funds tracking the Nasdaq Composite or Nasdaq-100 will, by default, gain exposure to Coinbase. In practice, this means that even without a deliberate decision to purchase crypto-related equities, pensions making investments to broadly track the Nasdaq will end up with Coinbase exposure proportional to its index weight, which is below 0.5%.

As a public company, Coinbase provides investors with indirect exposure to cryptocurrency markets through transaction-fee revenue, custody services, and other crypto-related business lines—without directly holding Bitcoin or other tokens on its own balance sheet for speculative purposes. Its revenue is closely tied to trading volumes and market sentiment in the crypto sector, making its stock highly correlated with broader digital asset cycles.

TABLE A2: 10 LARGEST COINBASE ($COIN) HOLDINGS BY PUBLIC PENSION SYSTEMS, FY25, Q3

State	Fund	Value of $COIN Holdings FY25 Q3
California	Public Employees Retirement System	$121.5M
California	California State Teachers Retirement System	$107.4M
Florida	State Board of Administration of Florida Retirement System	$65M
New York	New York State Common Retirement Fund	$77.3M
Wisconsin	State of Wisconsin Investment Board	$44.2M
Ohio	Public Employees Retirement System of Ohio	$26
Michigan	State of Michigan Retirement System	$20.7M
Arizona	Arizona State Retirement System	$19.8M
Texas	Teacher Retirement System of Texas	$19M
New Jersey	Retirement Systems of Alabama	$16.3M

Source: Fintel.io 13F filings; list of 10 public pension and retirement systems with the largest $MSTR positions as of Q3 2025 (Filed 5 Nov 2025).

3. "PICKS AND SHOVELS" DIGITAL ASSET INVESTMENTS BY PUBLIC PENSION FUNDS

PRIVATE EQUITY/HEDGE FUNDS

Private equity (PE) / venture capital (VC) funds pool capital from institutional investors to buy stakes in private companies, early-stage ventures, or infrastructure projects.

In the crypto context, these funds focus on blockchain infrastructure, digital asset platforms, payment systems, and other technology providers. Unlike public equities, PE/VC investments are illiquid, have long holding periods, and are valued periodically rather than marked to market. These investments generally demand higher fees and risk but can offer pensions exposure to crypto-sector growth without directly holding volatile tokens. This way, pensions can invest in the digital asset space through income-generating assets that, if needed, can be redeployed to adjacent sectors such as AI or broader technology infrastructure during a crypto downturn.

The following list presents a selection of publicly disclosed private equity and venture capital funds with exposure to cryptocurrencies or the broader digital-asset ecosystem, identified through investment disclosures in the annual reports of the Fairfax County

Employees' Retirement System, Fairfax County Police Officers Retirement System, and the Teacher Retirement System of Texas.[45]

Morgan Creek
Fairfax County Employees Retirement Systems ($168M) & Police Officer Retirement System ($105M);

Blockchain Capital
Fairfax County Employees Retirement Systems ($59M) & Police Officer Retirement System ($42M); Texas Teacher Retirement Systems

Parataxis Capital Main Fund
Fairfax County Employees Retirement Systems ($3M) & Police Officer Retirement System ($1M)

Polychain Capital
Fairfax County Employees Retirement Systems ($51M) & Police Officer Retirement System ($35M)

Coinfund Ventures
Texas Teacher Retirement Systems

EJF Silvergate Ventures Fund
Fairfax County PORS ($7M)

FIXED INCOME PRIVATE EQUITY FUNDS

In the crypto context, fixed-income strategies provide debt financing to companies operating in the blockchain, fintech, and digital asset ecosystem. These vehicles typically generate yield from secured loans or other credit arrangements, offering pensions exposure to the sector's growth with less direct price volatility than holding cryptocurrencies.

[45] "Annual Comprehensive Financial Report for the Fiscal Year Ended June 30, 2025," Fairfax County Employees' Retirement System, 2025. www.fairfaxcounty.gov/retirement/sites/retirement/files/Assets/ERS%20ACFR%20-%202025.pdf (10 Dec. 2025); "Annual Comprehensive Financial Report for the Fiscal Year Ended August 31, 2025," Teacher Retirement System of Texas, 2025. www.trs.texas.gov/sites/default/files/2025-11/2025-Annual-Comprehensive-Financial-Report.pdf (10 Dec. 2025).

Returns depend on borrower credit quality and sector health, and while they reduce token price risk, they still carry counterparty, liquidity, and market cycle exposure.

Parataxis Digital – High Yield Bonds
Fairfax County ERS ($33M) and Police ($13M)

4. NOTABLE PUBLIC PENSION SYSTEM INVESTMENTS IN DIGITAL ASSETS

While the U.S. public pension system's investment in digital assets is still in its early days, it is useful to examine several systems that have been early adopters in order to gather a sense of how the prime movers have approached a nascent investment opportunity in an emerging space. To date, prime movers include the states of Wisconsin and Michigan, where centralized pension investment boards have made significant early moves in the digital assets investment space, as well as the city of Houston, Texas, and Fairfax County, Virginia.

STATE OF WISCONSIN INVESTMENT BOARD

In early 2024, the State of Wisconsin Investment Board (SWIB) became one of the first U.S. state pension systems to allocate funds to spot Bitcoin ETFs. In its Q1 2024 Form 13F, SWIB disclosed holdings of 2.5 million shares of BlackRock's iShares Bitcoin Trust (IBIT), valued at about $99.1 million, and 1 million shares of Grayscale's Bitcoin Trust (GBTC), worth roughly $63.6 million, for combined Bitcoin ETF exposure exceeding $162 million.[46]

By mid-2024, SWIB had fully exited its Grayscale Bitcoin ETF position and increased its BlackRock's iShares ETF holdings. By year-end, the position had grown dramatically to more than 6 million IBIT shares, worth approximately $322 million[47]—about 0.2% of SWIB's $162+ billion portfolio.

In Q1 2025, SWIB liquidated its entire IBIT position,[48] selling all 6 million shares. The rationale for the exit has not been publicly detailed. In the same quarter, SWIB increased its

46 Di Salvo, "Wisconsin State Holds $163 Million in BlackRock, Grayscale Bitcoin ETF Shares."

47 Nguyen, "Wisconsin Bitcoin Investment $321.5M."

48 Lindrea, "Wisconsin Investment Board Sold Entire BlackRock Bitcoin ETF Stash."

position in MicroStrategy (MSTR) by 26,571 shares, an incremental investment of roughly $10.5 million.[49]

SWIB's Q3 public 13F filings show it owns shares in publicly traded companies adjacent to the crypto industry such as Coinbase, Marathon Digital, Riot Platforms, Block (formerly Square), Cipher Mining, Cleanspark, and MicroStrategy.

Inspired in part by Wisconsin's move, Jersey City, New Jersey's mayor announced on Twitter/X in 2024 plans for the city's municipal pension system to allocate up to 2% of its portfolio to Bitcoin ETFs.[50] As of the time of writing, there is no public filing or official disclosure confirming that this allocation has been implemented.

STATE OF MICHIGAN RETIREMENT SYSTEM

In July 2024, the State of Michigan Retirement System (SMRS) invested approximately $6.6 million in the ARK 21Shares Bitcoin ETF (ARKB)[51]—equating to roughly 110,000 shares, as disclosed in its SEC 13F filing.

By September 30, 2024, SMRS expanded into Ethereum ETFs, adding 460,000 shares of the Grayscale Ethereum Trust (ETHE), valued at approximately $10 million, and an additional 460,000 shares of the Grayscale Ethereum Mini Trust, valued near $1.1 million—bringing total Ethereum ETF exposure to roughly $11 million.[52] These purchases made SMRS the first publicly reported U.S. public pension system with direct Ethereum ETF exposure.

49 Francisco Rodrigues, "Wisconsin Sells Entire $350M Spot-Bitcoin ETF Stake," *Yahoo Finance*, 16 May 2025. www.finance.yahoo.com/news/wisconsin-sells-entire-350m-spot-123516505.html (22 Nov. 2025).

50 Ben Strack, "Jersey City Pension Funds BTC Exposure," Blockworks.com, 14 Nov. 2024. www.blockworks.co/news/jersey-city-pension-funds-btc-exposure (26 Nov. 2025); Steven Fulop (@StevenFulop), X post, 4 Dec. 2025. www.x.com/StevenFulop/status/1816452663191450015 (26 Nov. 2025).

51 Kathie O'Donnell, "Cryptocurrencies Rally as Michigan Retirement System, Emory Emerge as Buyers," P&I Online, 3 Dec. 2025. www.pionline.com/exchange-traded-funds/cryptocurrencies-rally-michigan-retirement-system-emory-emerge-buyers-crypto (20 Nov. 2025).

52 Lockridge Okoth, "Michigan Pension Fund Buys Ethereum ETF," BeInCrypto.com, 5 Nov. 2024. www.beincrypto.com/michigan-pension-fund-buys-ethereum-etf/ (20 Nov. 2025).

In Q2 2025, SMRS materially increased its Bitcoin allocation, tripling its ARKB position from roughly 100,000 to 300,000 shares, with a reported market value of approximately $10.7 million as of June 30, 2025.[53]

As of the Q3 2025 13F filing, SMRS reported 460,000 shares of ETHE valued at approximately $15.7 million and 300,000 shares of ARKB valued at roughly $11.4 million,[54] for a combined crypto ETF exposure of approximately $27 million—representing less than 0.03% of the system's $110.4 billion in total assets.[55]

HOUSTON FIREFIGHTERS' RELIEF AND RETIREMENT FUND

In October 2021, the Houston Firefighters' Relief and Retirement Fund (HFRRF) announced a $25 million allocation to Bitcoin and Ethereum for its defined benefit portfolio.[56] The transaction was executed through a customized private fund and was described in the joint press release as "the first announced investment in digital assets by a public pension plan in the U.S."[57]

In September 2023, HFRRF shifted its approach by transferring its Bitcoin holdings from NYDIG into the BlackRock Bitcoin Trust (IBIT). [58] This change occurred within HFRRF's newly

53 State Of Michigan Retirement System, *Form 13F-HR - Quarterly Report Filed by Institutional Managers, Holdings* (Q2 2025), filed 5 Aug. 2025. Accessed via SEC EDGAR search: www.sec.gov/Archives/edgar/data/762152/000076215225000008/0000762152-25-000008-index.html.

54 State of Michigan Retirement System, *Form 13F-HR - Quarterly Report Filed by Institutional Managers, Holdings* (Q3 2025), filed 5 Nov. 2025. Accessed via SEC EDGAR search: www.sec.gov/Archives/edgar/data/762152/000076215225000014/0000762152-25-000014-index.htm (17 Dec. 2025).

55 State of Michigan Retirement System, "October 2025 Quarterly Investment Review," October 2025. www.michigan.gov/treasury/-/media/Project/Websites/treasury/SMIB/2025/October-2025-SMIB-Report.pdf (17 Dec. 2025).

56 James Comtois, "Houston Firefighters Invests $25 Million in Cryptocurrency," *Pensions & Investments*, 3 Dec. 2025. www.pionline.com/pension-funds/houston-firefighters-invests-25-million-cryptocurrency (8 Dec. 2025).

57 NYDIG and Houston Firefighters' Relief and Retirement Fund, "Houston Firefighters Relief and Retirement Fund Announces Bitcoin Purchase," press release, PR Newswire, 21 Oct. 2025. www.prnewswire.com/news-releases/houston-firefighters-relief-and-retirement-fund-announces-bitcoin-purchase-301405769.html (8 Dec. 2025).

58 Rob Kozlowski, "Houston Firefighters Transfers Bitcoin Holdings to BlackRock ETF," *Pensions & Investments*, 29 Sep. 2023. www.pionline.com/searches-and-hires/houston-firefighters-transfers-bitcoin-holdings-blackrock (10 Dec. 2025).

defined "digital assets" asset class.[59] It reported holding $24 million in digital assets (held via iShares' IBIT) as of June 30, 2024, and $43 million as of June 30, 2025—approximately 1% of its portfolio.[60]

FAIRFAX COUNTY

Fairfax's Employee Retirement Funds (ERS) and Police Officers Retirement Systems (PORS) were pioneers, investing in blockchain-related assets in 2018 through venture capital funds, committing $10 million (ERS) and $11 million (PORS).[61] In 2022, ERS had 3.96% of its assets in dedicated blockchain funds (plus 0.95% in FinTech), and PORS had 7.19% in blockchain funds (plus 0.82% in FinTech).[62]

In its FY 2025 Annual Comprehensive Financial Report (year ended June 30, 2025), both ERS and PORS list a multitude of blockchain / digital-asset-oriented private-markets equity funds (see Appendix Section 3). In total, the tracked digital-asset-associated private equity funds sum to roughly $314 million for ERS, representing about 6% of its $5.35 billion under management, and about $203 million for PORS, representing roughly 10% of its $2.0 billion under management.

59 Houston Firefighters' Relief and Retirement Fund (HFRRF), "Report on Investments, Compliance, Asset Allocation, Portfolio Structure, Performance Reviews, Benchmarks, Costs, Leverage and Disclosures," 3 May 2023. Accessed via Texas Pension Review Board website: www.prb.texas.gov/wp-content/uploads/2024/07/Houston-Fire-2023.pdf (8 Dec. 2025).

60 Houston Firefighters' Relief and Retirement Fund, "Annual Comprehensive Financial Report – Component Unit of the City of Houston, TX for Fiscal Years Ended June 30, 2025 and June 30, 2024," 9 Dec. 2024. www.hfrrf.org/Resources/3e9dabcd-c207-479f-a23d-0183f8abe8c2/HFRRF-ACFR%20FY24.pdf (20 Dec. 2025).

61 Jeff Weiler, Executive Director, Fairfax County Retirement Systems, "A Note from the Executive Director: Our Investments in Blockchain Technology," Fairfax County, 2025. www.fairfaxcounty.gov/retirement/note-executive-director-our-investments-blockchain-technology (9 Dec. 2025).

62 Jeff Weiler, Executive Director, Fairfax County Retirement Systems, "Response to Recent Media Attention Regarding Blockchain Investments," Fairfax County, updated 14. Feb. 2025. www.fairfaxcounty.gov/retirement/response-recent-media-attention-regarding-blockchain-investments-updated (8 Nov. 2025).

TEACHER RETIREMENT SYSTEM OF TEXAS

Texas TRS took on its first explicitly crypto-related exposure through venture capital mandates in 2022. That summer, TRS committed $20 million to CoinFund Ventures I Onshore, an early-stage "web3" / blockchain venture fund managed by CoinFund.[63]

The same year, Texas TRS also committed $25 million to Distributed Global Ventures III LP, described in fundraising reports as a digital-assets-focused venture capital fund managed by Distributed Global, an investment firm specializing in blockchain and digital-asset strategies.[64] TRS's 2024 ACFR confirms that CoinFund and Distributed Global remain among its external managers, but it does not publish updated fair values for these specific funds.[65]

[63] David G. Barry, "Teacher Retirement System of Texas Invests in Crypto Fund," *MarketsGroup*, 8 Feb. 2025. www.marketsgroup.org/news/crypto-teacher-retirement-texas (8 Nov. 2025).

[64] Koncheng Moua, "Texas TRS Commits $750M to Alternatives," Dakota.com, 7 Oct. 2025. www.dakota.com/fundraising-news/texas-trs-commits-750m-to-alternatives (8 Nov. 2025).

[65] Teacher Retirement System of Texas, "2024 Annual Comprehensive Financial Report," 20 Nov 2024. www.trs.texas.gov/sites/default/files/migrated/TRS-Documents-trs-acfr-2024.pdf (20 Dec. 2025).

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Gilroy and the Pension Integrity Project have provided technical assistance to several successful pension reform efforts in recent years in Texas, Michigan, Colorado, Arizona, South Carolina, North Dakota and other states aimed at tackling persistent pension solvency challenges.

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