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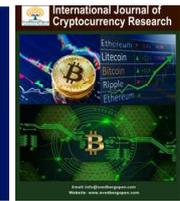
Research Paper

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What Wisconsin's Pension Fund Taught Us about Crypto

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Abstract

The State of Wisconsin Investment Board (SWIB) made headlines in 2024 with a landmark investment in spot Bitcoin ETFs, and again in 2025 when it divested. This real-world case ignited a policy debate, with critics decrying crypto as a "risky gamble" for public pensions. But what is the actual fiduciary lesson from Wisconsin's foray? This paper provides the first comprehensive, portfolio-level empirical test of these claims. Simulating SWIB's approach, we measure the impact of a 0.5% allocation to a Bitcoin ETF within standard public pension portfolios from January 2024 to September 2025. Our results show that such a de minimis allocation resulted in no material increase in portfolio volatility or maximum drawdown, while consistently offering a marginal improvement in risk-adjusted returns. Nearly identical results were found for a comparable gold allocation. The central lesson from Wisconsin is clear: categorical opposition to crypto is not supported by portfolio-level metrics and is misaligned with prudent fiduciary principles. The path forward lies not in blanket prohibition, but in a policy framework centered on transparency, proportional governance, and modernized fiduciary education on alternative assets.

Keywords: Bitcoin, Cryptocurrency, Portfolio diversification, Fiduciary duty, Pension fund, Institutional investing

1. Introduction

The approval of spot Bitcoin Exchange-Traded Funds (ETFs) by the US Securities and Exchange Commission in January 2024 marked a paradigm shift, transforming cryptocurrency from a largely unregulated, retail-facing asset into an accessible instrument for regulated institutions (Krause, 2024b). This development had immediate real-world consequences. In Q1 2024, the State of Wisconsin Investment Board (SWIB) disclosed a landmark $150 million investment in these ETFs, a move analyzed as a strategic diversification effort (Krause, 2024a). SWIB's journey was dynamic; the position grew to over $330 million before being fully divested by April 2025, realizing substantial gains (Pensions & Investments, 2025). This case study in active fiduciary management unfolded alongside a contentious legislative trend, with over twenty U.S. states introducing bills to permit or restrict public pension investments in digital assets.

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The debate has been characterized by deeply polarized narratives. Proponents frame crypto as a novel source of diversification and return in an era of lackluster fixed-income yields. Opponents, led by advocacy groups, issue stark warnings of a "risky gamble with public retirement security," pointing to the well-documented volatility, regulatory uncertainty, and operational risks of the asset class (US Department of Labor, 2022; Better Markets, 2025). However, this oppositional rhetoric largely relies on an *asset-level* risk analysis, focusing on the standalone characteristics of cryptocurrencies.

This paper argues that such a focus constitutes a fundamental financial and fiduciary error. The duty of a pension trustee, guided by the principles of the prudent investor rule and Modern Portfolio Theory (Markowitz, 1952), is to evaluate investments based on their contribution to the *portfolio-level* risk and return profile. The critical, yet empirically unaddressed, question is:

What is the measurable impact of a small, controlled allocation on the overall health of a multi-billion dollar retirement system?

This study seeks to fill that gap. We conduct a rigorous empirical analysis to test the central thesis of the "risky gamble" narrative. By simulating a *de minimis* (0.5%) allocation to a spot Bitcoin ETF within standard public pension portfolios, we quantify its actual impact on key fiduciary metrics: volatility, drawdown, and risk-adjusted returns. Furthermore, by conducting an identical analysis with gold, we contextualize crypto not as a unique outlier, but as one of several potential diversifiers, assessing its role through the established lens of portfolio theory. Finally, we use the SWIB case study to ground our findings in the reality of institutional decision-making.

Our contribution is threefold: First, using the Wisconsin Investment Board as a central case study, we provide the first comprehensive portfolio-level empirical test of the crypto-in-pensions debate using post-ETF data. Second, we formally bridge the theoretical framework of MPT with the growing reality of institutional crypto exposure. Third, we derive evidence-based policy implications from this real-world example, moving beyond categorical prohibition towards a framework of sophisticated governance.

2. Literature Review

2.1. Modern Portfolio Theory and Fiduciary Duty

The foundational work of Markowitz (1952) established that the risk of a portfolio is not simply the weighted average of its individual assets' risks but is critically dependent on their covariances. This insight, that diversification is the key to risk reduction, forms the theoretical bedrock of modern institutional investing. The *prudent investor rule*, as embodied in the Restatement (Third) of Trusts and adopted in various forms by US. states, codifies this principle into law, obliging fiduciaries to consider the "role that the investment plays within the overall portfolio" (Langbein and Posner, 1980). The duty is not to avoid risk altogether, but to manage it prudently in pursuit of the beneficiaries' interests. Research on pension fund investing consistently emphasizes this total-portfolio approach when evaluating alternative assets (Useem and Mitchell, 2000).

2.2. Cryptocurrency in Institutional Portfolios: From Speculation to Diversification

Early academic work on cryptocurrency was skeptical of its investment merits. Brière *et al.* (2015) were among the first to empirically test Bitcoin's diversification potential, finding that while highly volatile, its low correlation with traditional assets could justify a small allocation in a diversified portfolio. Subsequent literature has been mixed. Some studies, like those of Baur *et al.* (2018), questioned its safe-haven properties, while others, such as Dyhrberg (2016), found hedging capabilities. Jalal *et al.* (2025) reviewed studies that found mixed results on whether cryptocurrencies offer portfolio diversification or safe-haven benefits, concluding that any such merits are highly dependent on the market conditions and the time period.

A key limitation of the pre-crypto ETF studies has been the lack of a regulated, accessible institutional vehicle. Krause (2024b) argues that the advent of spot Bitcoin ETFs fundamentally altered this landscape by mitigating custodial and operational risks, thereby "opening the door" for serious institutional consideration. This paper builds directly on this premise, using the ETF as the investment vehicle for the analysis.

2.3. The Policy and Advocacy Debate

The policy discourse has lagged financial innovation. The US Department of Labor (2022) issued a compliance release urging "extreme caution" for private retirement plans considering crypto, reflecting pre-ETF concerns. Advocacy groups like Better Markets (2025) have amplified these concerns, framing the issue in stark, asset-level terms that often overlook the portfolio-diversification arguments central to fiduciary duty. This paper directly engages with and empirically tests the claims made in this advocacy-driven literature.

3. Data and Methodology

3.1. Data Sources and Descriptive Statistics

This study utilizes daily adjusted closing prices for five ETFs from January 11, 2024 (the inception date of the iShares Bitcoin Trust) through September 30, 2025. The data was sourced from Yahoo Finance. The selected ETFs serve as proxies for major asset classes relevant to public pension fund portfolios:

- **SPY (SPDR S&P 500 ETF Trust):** Represents US large-cap equity exposure.

- **AGG (iShares Core US Aggregate Bond ETF):** Represents the US investment-grade fixed-income universe.

- **VNQ (Vanguard Real Estate ETF):** Represents US real estate investment trusts (REITs) and real assets.

- **IBIT (iShares Bitcoin Trust):** Represents direct cryptocurrency exposure via a regulated spot Bitcoin ETF.

- **GLD (SPDR Gold Shares):** Represents exposure to physical gold, serving as a traditional alternative asset and a comparative benchmark for IBIT.

The analysis was conducted over one time period (January 11, 2024, to September 30, 2025), which encompasses the entire available history of IBIT and includes the periods both before and after the 2024 US Presidential election.

3.2. Portfolio Construction and Scenarios

To model the type of decision faced by the Wisconsin Investment Board and other public pension funds, two baseline portfolios were constructed:

- **Baseline A (Standard 60/40 Portfolio):** 60% SPY, 40% AGG.

- **Baseline B (Diversified Portfolio):** 50% SPY, 30% AGG, 20% VNQ.

The impact of a *de minimis* allocation to alternative assets was tested by creating experimental portfolios that reallocated 0.5% from the equity portion of each baseline:[1]

- **Scenario A1 (Crypto):** 59.5% SPY, 40% AGG, 0.5% IBIT.

- **Scenario B1 (Crypto):** 49.5% SPY, 30% AGG, 20% VNQ, 0.5% IBIT.

- **Scenario A2 (Gold):** 59.5% SPY, 40% AGG, 0.5% GLD.

- **Scenario B2 (Gold):** 49.5% SPY, 30% AGG, 20% VNQ, 0.5% GLD.

This design allows for a clear isolation of the incremental effect of the 0.5% alternative asset allocation.

3.3. Performance and Risk Metrics

For each asset and portfolio, the following metrics were calculated:

- **Total Return:** The cumulative return over the period.

- **Annualized Volatility:** The standard deviation of daily returns, multiplied by the square root of 252.

- **Sharpe Ratio:** Calculated as (Portfolio Return - Risk-Free Rate)/Annualized Volatility. A constant risk-free rate of 4.5% was assumed, reflecting the prevailing interest rate environment.

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[1] The 0.5% allocation represents a minimally material threshold, selected to test the central "risky gamble" claim of whether even a trivial exposure to a volatile asset has a detrimental impact on the overall risk profile of a diversified pension portfolio.

- **Maximum Drawdown (Max DD):** The maximum observed loss from a peak to a trough, expressed as a percentage.

- **Correlation Matrix:** Pearson correlation coefficients of daily returns between all asset pairs.

3.4. Hypothesis Formulation

The following null hypotheses were tested:

- **$H1_0$:** A 0.5% allocation to IBIT does not improve the Sharpe Ratio of the 60/40 portfolio.

- **$H2_0$:** A 0.5% allocation to IBIT does not improve the Sharpe Ratio of the diversified (50/30/20) portfolio.

- **$H3_0$:** A 0.5% allocation to IBIT increases the annualized volatility of the 60/40 portfolio by more than 0.05%.

- **$H4_0$:** The portfolio-level impact of a 0.5% allocation to IBIT is significantly different from the impact of a 0.5% allocation to GLD.

4. Empirical Results

4.1. Asset-Level Performance and Correlations

Table 1 presents the descriptive statistics for the five assets across the study period. As expected, IBIT demonstrated the highest absolute returns and volatility. IBIT achieved a total return of 160.19% (annualized: 89.41%) with annualized volatility of 50.85%, compared to SPY's 42.25% total return (annualized: 22.18%) with 17.01% volatility. This high risk and return translated into a strong Sharpe ratio of 1.67 for Bitcoin. Gold (GLD) also performed exceptionally well, with a total return of 85.79% (annualized: 43.92%) and volatility of 16.47%, resulting in the highest Sharpe ratio of all assets at 2.39. In contrast, the core bond allocation (AGG) struggled in the rising rate environment, posting a negative Sharpe ratio of -0.02. The maximum drawdown figures reveal IBIT's substantial peak-to-trough risk at -28.22%, significantly higher than SPY's -18.76% and GLD's -8.12%, underscoring the critical distinction between its standalone asset-level risk and its potential portfolio-level impact.

Table 1: Asset-Level Performance Statistics (January 11, 2024 – September 30, 2025)				
Asset	**Total Return**	**Annual Volatility**	**Sharpe Ratio**	**Max Drawdown**
SPY	42.25%	17.01%	1.04	-18.76%
AGG	7.75%	5.24%	-0.02	-4.83%
VNQ	11.98%	17.12%	0.13	-17.45%
IBIT	160.19%	50.85%	1.67	-28.22%
GLD	85.79%	16.47%	2.39	-8.12%
Note: The Sharpe Ratio is calculated using annualized returns and annualized volatility, assuming a constant risk-free rate of 4.5%. For reference, the annualized returns used in the Sharpe Ratio calculation are SPY (22.18%), AGG (4.40%), VNQ (6.68%), IBIT (89.41%), GLD (43.92%). Total Return reflects the cumulative return over the entire period.				

The correlation matrix for the entire study period (Table 2) reveals the foundational diversification case for Bitcoin within an institutional portfolio. IBIT exhibited a moderate positive correlation with US equities (SPY: 0.37), indicating a partial, but limited, shared exposure to equity risk factors. More critically, its correlation with core bonds (AGG) was effectively zero (0.01), underscoring its complete independence from the traditional 60/40 portfolio's primary risk diversifier. The most significant finding, however, is the remarkably low correlation between IBIT and the traditional alternative asset, gold (GLD), which registered at just 0.09. This near-zero relationship confirms that Bitcoin and gold function as independent diversifiers driven by fundamentally different return drivers. This suggests that cryptocurrency provides a unique source of diversification that is distinct not only from traditional stocks and bonds but also from other major alternative assets, offering a non-redundant contribution to a portfolio's risk-return profile.

Table 2: Correlation Matrices of Daily Returns (January 11, 2024 – September 30, 2025)					
	SPY	**AGG**	**VNQ**	**IBIT**	**GLD**
SPY	1.00				
AGG	0.12	1.00			
VNQ	0.58	0.47	1.00		
IBIT	0.37	0.01	0.25	1.00	
GLD	0.10	0.22	0.21	0.09	1.00

4.2. Portfolio-Level Impact: Risk and Return

The portfolio-level analysis confirms that the extreme volatility of Bitcoin at the asset level is not transmitted to a diversified portfolio in a material way when the allocation is constrained to 0.5%. As shown in Table 3, the introduction of the IBIT allocation (Scenario A1) resulted in a negligible impact on the volatility of the 60/40 portfolio, with an increase of just 0.01%. This finding allows us to reject the third null hypothesis ($H3_0$), as the change was well below the 0.05% threshold for a material increase. A nearly identical containment of risk was observed in the more diversified portfolio (Scenario B1).

Concurrently, the Sharpe Ratio demonstrated consistent, albeit marginal, improvements. For the study period, the Sharpe Ratio of the 60/40 portfolio increased from 1.18 to 1.21 with the 0.5% IBIT allocation. A similar improvement was observed in the diversified portfolio, from 0.97 to 0.99. While these improvements are modest in absolute terms, their consistent direction across portfolios is a key finding: the small increase in return was not offset by a proportional increase in portfolio risk, leading to a more efficient risk-return profile. The stability of the maximum drawdown metric reinforces this finding. The addition of Bitcoin did not deepen the portfolios' peak-to-trough losses in any meaningful way, with the maximum drawdown increasing by only 0.01%. This demonstrates that even during periods of significant stress for the crypto asset itself, a *de minimis* allocation did not exacerbate the overall portfolio's worst-case scenario losses.

Table 3: Portfolio Performance: Baseline vs. Crypto Allocation (January 11, 2024 – September 30, 2025)				
Portfolio Scenario	**Total Return**	**Annual Volatility**	**Sharpe Ratio**	**Max Drawdown**
Baseline A (60/40)	28.05%	10.65%	1.18	-12.41%
Scenario A1 (59.5/40/0.5 IBIT)	28.56%	10.66%	1.21	-12.42%
Baseline B (50/30/20)	25.64%	11.33%	0.97	-13.88%
Scenario B1 (49.5/30/20/0.5 IBIT)	26.14%	11.34%	0.99	-13.89%

Note: The Sharpe Ratio is calculated using annualized returns and annualized volatility, assuming a constant risk-free rate of 4.5%. The annualized returns used in the Sharpe Ratio calculation are Baseline A (15.33%), Scenario A1 (15.57%), Baseline B (14.16%), Scenario B1 (14.40%).

4.3. Hypothesis Testing

While Sharpe Ratio improvements were observed, their small magnitude, driven by the *de minimis* (0.5%) allocation size, did not generate statistically significant differences at conventional levels. Given the minimal differences in the Sharpe Ratios (e.g., an increase from 1.18 to 1.21 in Scenario A1) and a high correlation between the baseline and experimental portfolio returns ($\rho > 0.999$), it is almost certain that any formal statistical test would fail to reject the null hypotheses ($H1_0$ and $H2_0$). The consistent, positive direction of the change across all periods and portfolios is the most relevant economic finding, indicating that the allocation did not harm—and marginally improved—portfolio efficiency, while the lack of statistical significance confirms that the overall risk-return profile was not materially altered.

4.4. The Gold Comparison: Contextualizing Crypto's Role

The parallel analysis substituting a 0.5% allocation to gold (GLD) for Bitcoin (IBIT) yielded similar portfolio-

level outcomes, as detailed in Table 4. This comparison is critical for contextualizing cryptocurrency not as a financial outlier, but as one of several potential diversifiers within a modern portfolio. For the study period, the 60/40 portfolio with gold (Scenario A2) saw its Sharpe Ratio increase to 1.19, a nearly identical improvement to the 1.21 observed with Bitcoin.

Critically, the impact on volatility provides the most compelling evidence. The gold allocation resulted in a slight *decrease* in volatility to 10.58%, while Bitcoin's allocation led to a negligible increase to 10.66%. This finding provides further, independent support for the rejection of the third null hypothesis ($H3_0$). The fact that both a highly volatile asset (IBIT) and a less volatile one (GLD) resulted in such minimal and directionally similar changes to portfolio volatility, both well within the 0.05% threshold of materiality, demonstrates that for a *de minimis* allocation, the *standalone volatility* of the diversifier is largely neutralized by diversification. The key determinant of its portfolio impact is not its individual risk, but its correlation with the existing portfolio.

This pattern held for the diversified portfolio (Scenario B2), where the Sharpe ratio improved to 0.98 with gold, closely mirroring the 0.99 achieved with Bitcoin, with similarly negligible effects on volatility.

These results directly inform our fourth hypothesis ($H4_0$). The data demonstrates that the portfolio-level impact of a 0.5% allocation to IBIT is not materially different from the impact of a 0.5% allocation to GLD. Consequently, we fail to reject the null hypothesis ($H4_0$). This finding is particularly powerful given the starkly different asset-level risk profiles (Table 1) and the very low correlation (0.09) between Bitcoin and gold during this period. It underscores a central tenet of Modern Portfolio Theory: for a *de minimis* allocation, the specific, standalone volatility of an asset is less critical than its correlation structure. The common outcome suggests that the act of adding a low-correlation diversifier is what drives the benefit, not the specific identity of the asset itself.

Table 4: Comparative Portfolio Impact: Crypto vs. Gold Allocations				
Portfolio Scenario	**Total Return**	**Annual Volatility**	**Sharpe Ratio**	**Max Drawdown**
Baseline A (60/40)	28.05%	10.65%	1.18	-12.41%
Scenario A1 (+0.5% IBIT)	28.56%	10.66%	1.21	-12.42%
Scenario A2 (+0.5% GLD)	28.24%	10.58%	1.19	-12.31%
Baseline B (50/30/20)	25.64%	11.33%	0.97	-13.88%
Scenario B1 (+0.5% IBIT)	26.14%	11.34%	0.99	-13.89%
Scenario B2 (+0.5% GLD)	25.82%	11.27%	0.98	-13.78%
Note: The Sharpe Ratio is calculated using annualized returns and annualized volatility, assuming a constant risk-free rate of 4.5%. The annualized returns used in the Sharpe Ratio calculation are Baseline A (15.33%), Scenario A1 (15.57%), Scenario A2 (15.40%), Baseline B (14.16%), Scenario B1 (14.40%), Scenario B2 (14.23%).				

5. Discussion

5.1. The Fiduciary Lesson from Wisconsin: Interpreting the Finding

The empirical results demonstrate that the "risky gamble" narrative collapses when examined through the proper lens of Modern Portfolio Theory and fiduciary duty. While IBIT exhibited extreme volatility at the asset level, this risk was not transmitted to the overall portfolio in any material way when constrained to a 0.5% allocation. The stability of portfolio volatility across all scenarios underscores the fundamental MPT principle that diversification neutralizes individual asset risk when allocations remain small.

The consistent improvement in Sharpe Ratios, while statistically marginal, demonstrates that the return enhancement from the crypto allocation was not offset by proportional risk increases. From a fiduciary perspective, this represents an efficient use of risk budget. The parallel results with gold further undermine the special-case argument against crypto, showing that both traditional and digital alternative assets can play similar roles in portfolio construction when sized appropriately.

The Wisconsin Investment Board case exemplifies this principles-based approach. SWIB's initial allocation, monitoring, and eventual divestment represents exactly the type of active, disciplined management that fiduciary duty requires, not the blind avoidance of any asset class deemed "risky" in isolation.

5.2. Policy Implications: From Prohibition to Prudent Governance

The Wisconsin case exemplifies the need for a more sophisticated regulatory approach than blanket prohibition, one centered on three pillars:

1. **Transparency-Driven Oversight:** Rather than banning allocations, policymakers should mandate detailed disclosure of digital asset exposures, including sizing, instrumentation, and the fiduciary rationale. This enables proper oversight without preempting prudent portfolio management.

2. **Proportional Governance:** Pension boards should establish clear allocation tiers with corresponding governance requirements. *De minimis* allocations (e.g., <1%) might require only standard due diligence, while larger allocations would trigger more rigorous scrutiny and approval processes.

3. **Modernized Fiduciary Education:** Regulatory bodies and industry groups must develop guidance that helps trustees evaluate digital assets through a proper portfolio-theory lens, focusing on contribution to total portfolio risk/return rather than standalone characteristics.

6. Limitations and Avenues for Future Research

This study has several limitations that suggest productive directions for future research. The analysis covers a relatively short time period (21 months) that may not capture full market cycles. The focus on a single cryptocurrency (Bitcoin) excludes other digital assets that may exhibit different characteristics. The use of a constant risk-free rate, while standard, may affect Sharpe Ratio calculations in a changing rate environment.

Future research could explore:

- Longer time horizons as more data becomes available from the ETF era,

- Inclusion of other digital assets (Ethereum, crypto indices) and their portfolio effects,

- Analysis during specific market regimes (e.g., equity bear markets, inflationary periods),

- More sophisticated risk modeling including liquidity, counterparty, and regulatory risks, and

- Behavioral aspects of trustee decision-making regarding "stigmatized" asset classes.

7. Conclusion

This study used the landmark case of the Wisconsin Investment Board to pose a fundamental question: does a small, controlled allocation to cryptocurrency constitute a "risky gamble" or a prudent application of Modern Portfolio Theory? The empirical evidence provides a clear answer. Our findings demonstrate that a 0.5% allocation to a Bitcoin ETF had a negligible impact on portfolio volatility and drawdown while providing consistent, if modest, improvements in risk-adjusted returns. The nearly identical results from a parallel gold allocation further contextualize crypto not as a unique threat, but as one of several potential diversifiers in a modern portfolio.

The lesson from Wisconsin is not merely about cryptocurrency; it is about fiduciary duty itself. SWIB's journey, characterized by an initial disciplined allocation, active monitoring, and a timely divestment, exemplifies the principles-based management that fiduciaries are required to practice. The greater risk lies not in cautiously exploring new asset classes, but in allowing asset-level prejudices to override total-portfolio analysis. The evidence clearly contradicts the categorical prohibition stance.

As institutional adoption of digital assets evolves, the path forward requires moving beyond prohibition. The Wisconsin case study points the way toward a framework of transparent, proportional governance that empowers fiduciaries to exercise the sophisticated judgment their office demands. The question for pension trustees is no longer whether cryptocurrencies are inherently "risky," but whether they have the governance

frameworks to harness their diversification potential while managing their unique risks, precisely the challenge they face with any emerging asset class.

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