



# Final Project

Evaluate adding Bitcoin to the portfolio of Illinois State Board of Investment

- ISBI investment objectives and current portfolio
- Methodology
- Value proposition of Bitcoin investments
- Results
- Conclusion

REDACTED, Jared Szajkowski (REDACTED), REDACTED

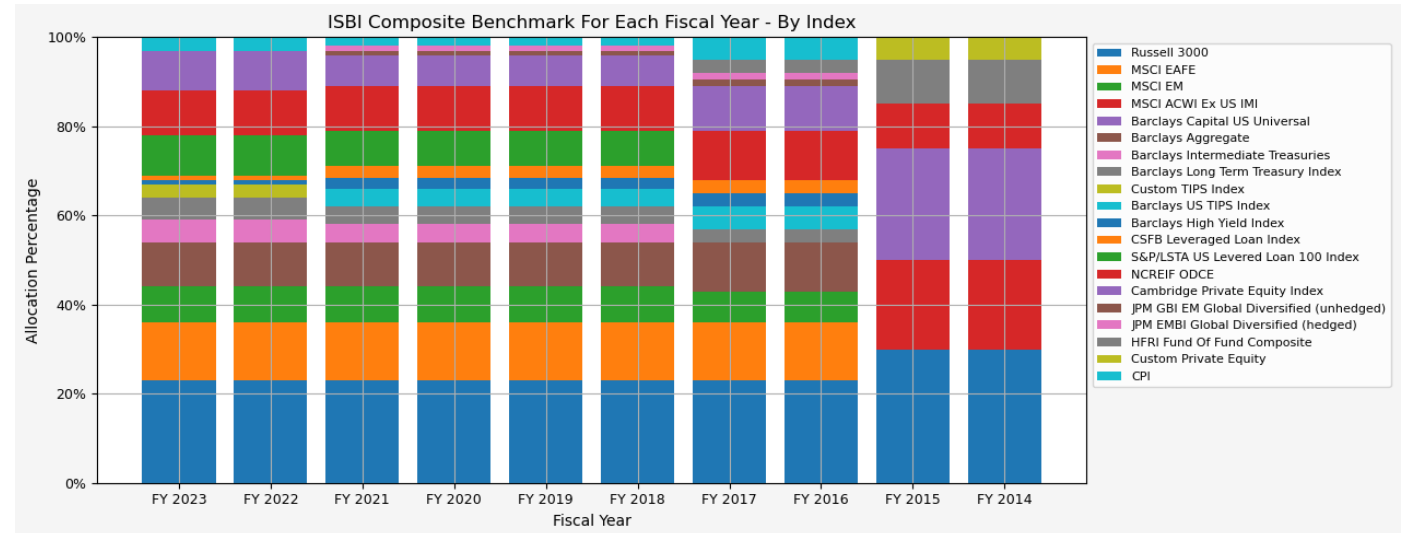
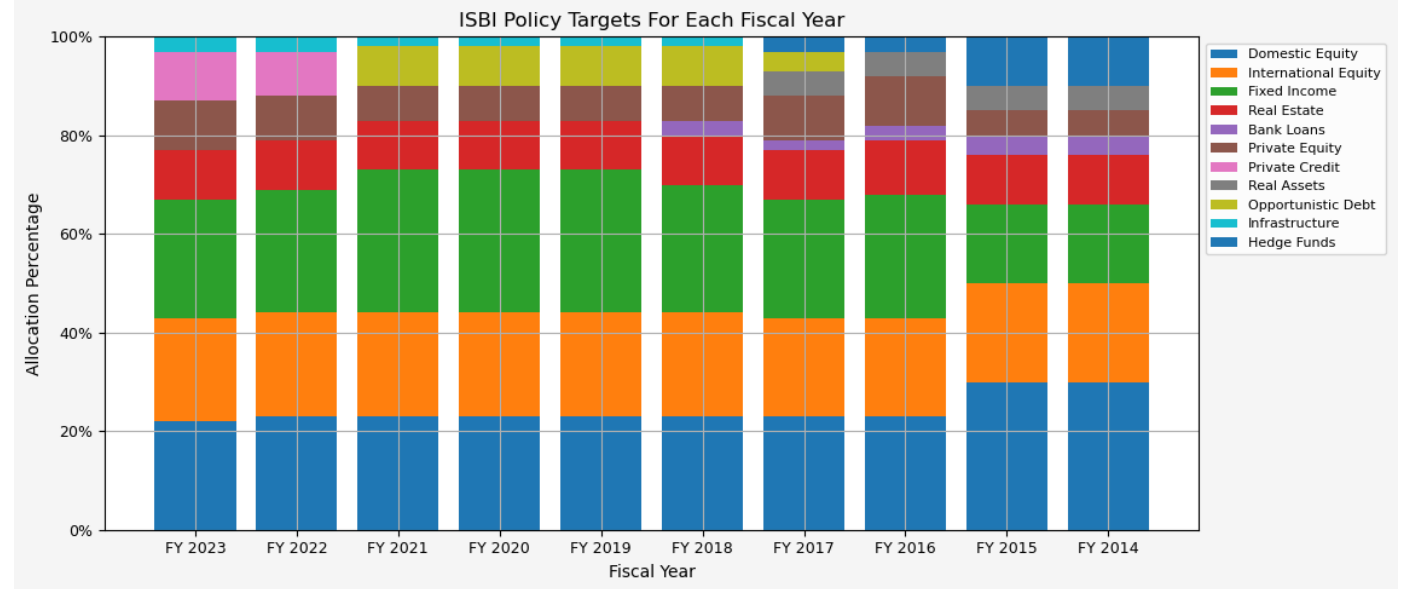
# ISBI Investment Objectives and Portfolio

## Portfolio

- ISBI manages ~\$25B assets in defined pension plan for more than 100,000 state employees
- Existing portfolio includes a wide array of asset classes, including domestic and international equities, real estate, private credit, private equity, and fixed income

## Investment Objectives

- Earn sufficient returns to meet pension obligations
- Risk awareness due to the nature of pension fund and obligations
- Performance is compared to a composite benchmark defined using a combination of public and private indices



# Methodology

- Identified publicly available funds and indices to develop a *proxy* composite benchmark that reproduces the annual returns of the fund within 1%
- All analysis and calculations were performed on the proxy composite benchmark
  - Actual portfolio holds thousands of securities, including private and esoteric ones
  - Portfolio performance tracks the benchmark relatively closely
  - The purpose is to optimize on the macro asset level; any divergence of the ISBI portfolio from benchmark has low conceptual relevance
- Added 1% - 10% of Bitcoin to the ISBI portfolio and re-weighted the remaining asset classes proportionally
- Compared the results of the modified asset allocation to the proxy composite benchmark

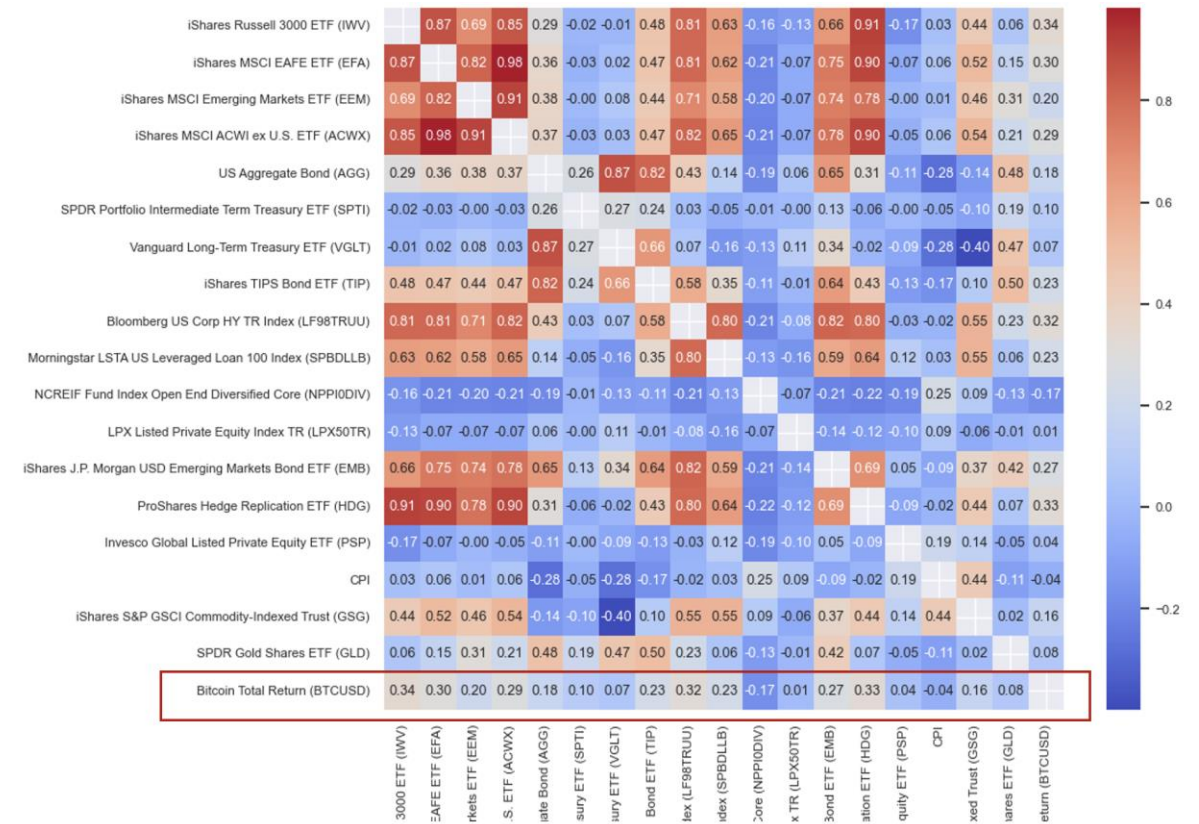
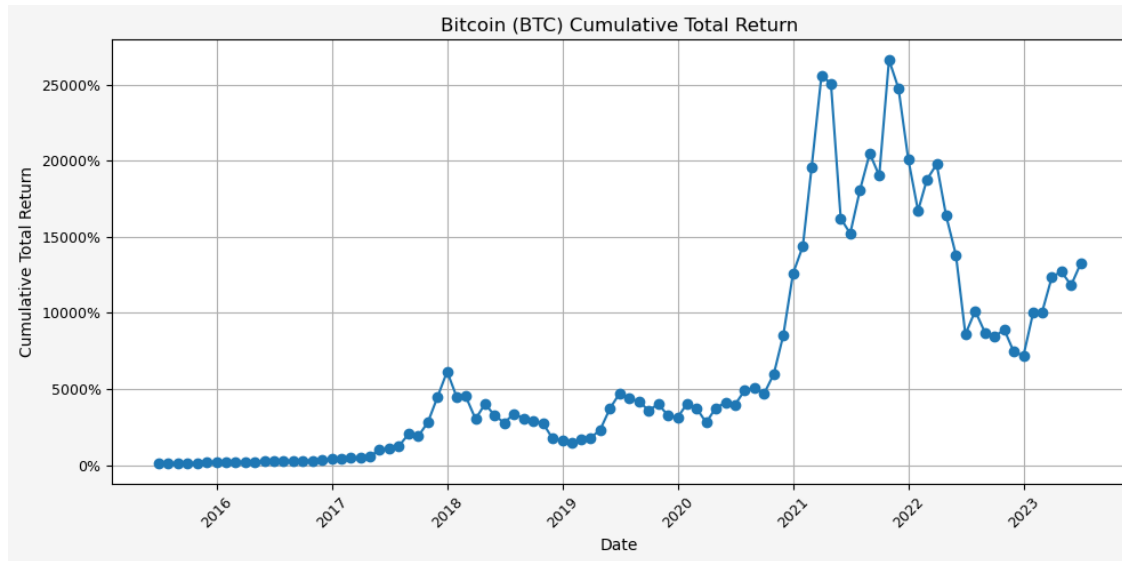
# Why Bitcoin?

**Diversification** – Low correlation with other asset classes

**Growth potential** – Exhibited superior returns so far, despite volatility

**Inflation hedge** – Finite supply of Bitcoin can hedge against fiat currency devaluation (total BTC in Existence: 19,715,737.5)

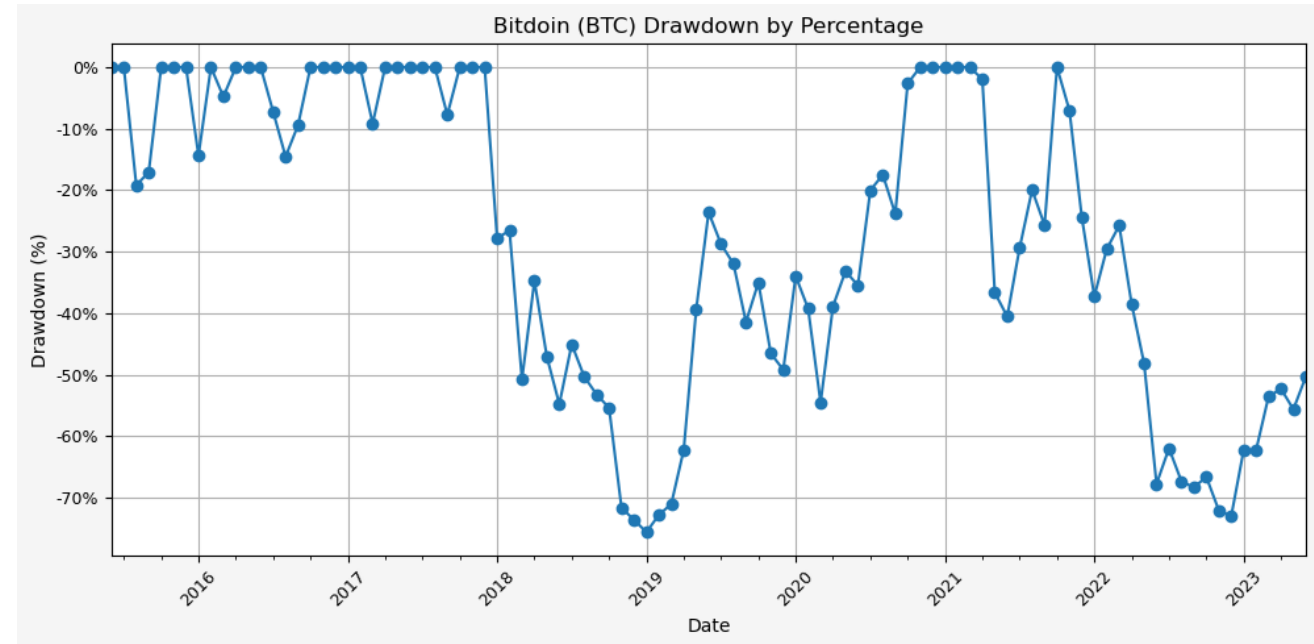
**Strategic Positioning** – Innovative investment opportunity that enhances overall portfolio performance



- Between 6/30/2015 and 6/30/2023, Bitcoin experienced an increase of over 12,500%, annualized return of 82%
- Highest correlations is with US equities and the lowest is with real estate

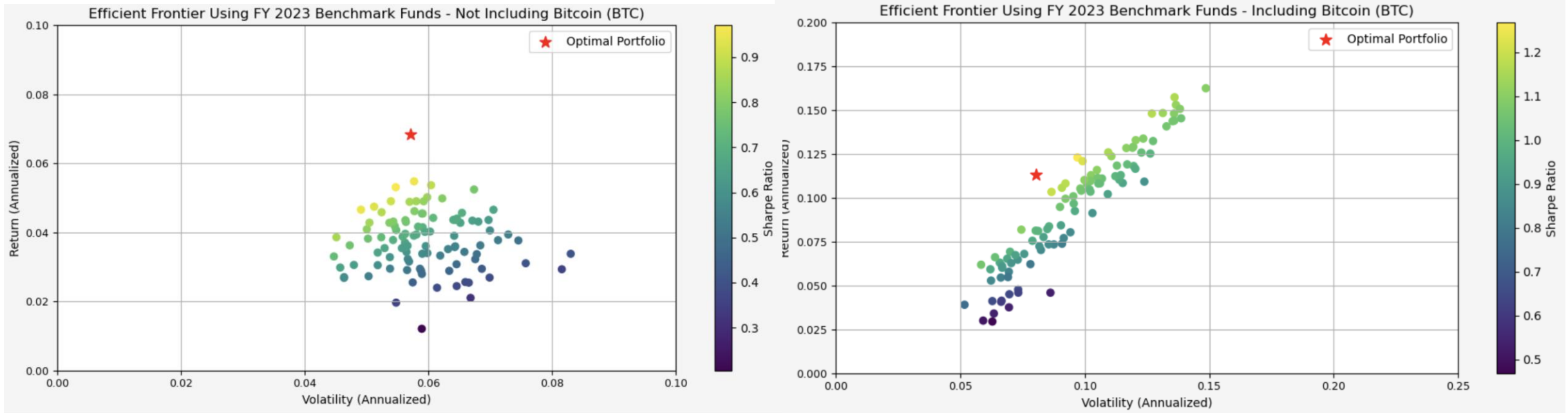
# Why No Bitcoin?

- **Volatility** – Known for its extreme price volatility
- **Regulatory Risks** – Subject to regulatory uncertainty
- **Liquidity Risk** – Still lacks the liquidity of traditional assets like stocks and bonds
- **Security Risks** – Ownership requires safeguarding private keys and using secure storage solutions (hardware wallets or external custody or invest in ETFs)
- **Diversification Risks** – Correlations may change over time and may not exhibit same diversification benefits
- **Technology Risks** – There is a risk of technological obsolescence, security vulnerabilities, or protocol changes that could impact the usability, scalability, or security of Bitcoin.
- **Environmental Risks** – Regulatory efforts to address environmental concerns or shift towards more eco-friendly cryptocurrencies could affect the value and adoption of Bitcoin.
- **Drawdowns** – Has experienced significant drawdowns related to the volatility



Bitcoin has experienced several drawdowns > 70% between 6/30/2015 and 6/30/2023

# Efficient Frontier



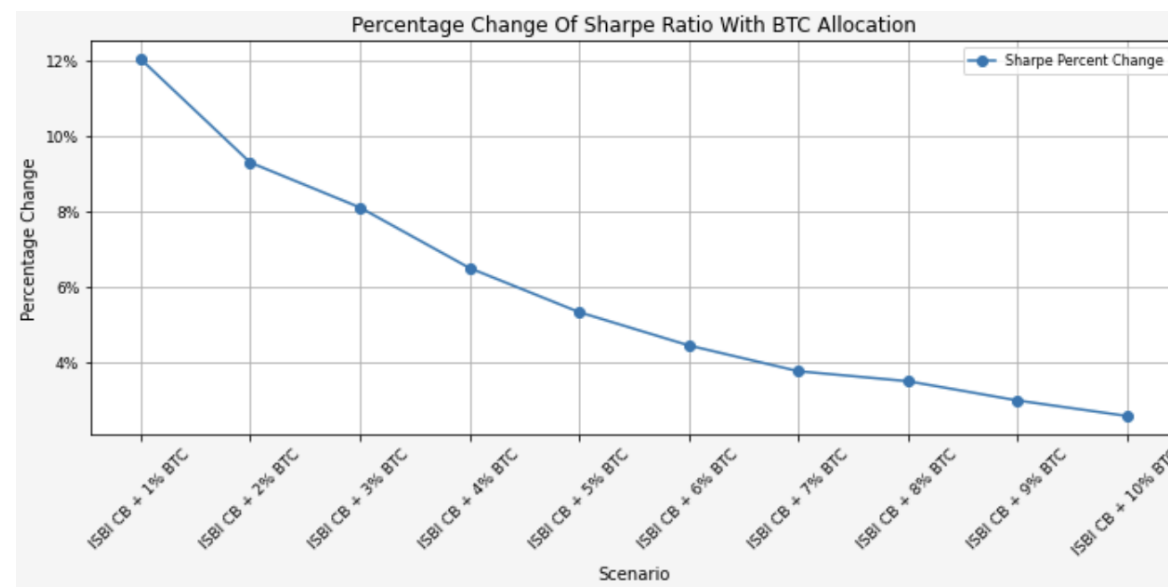
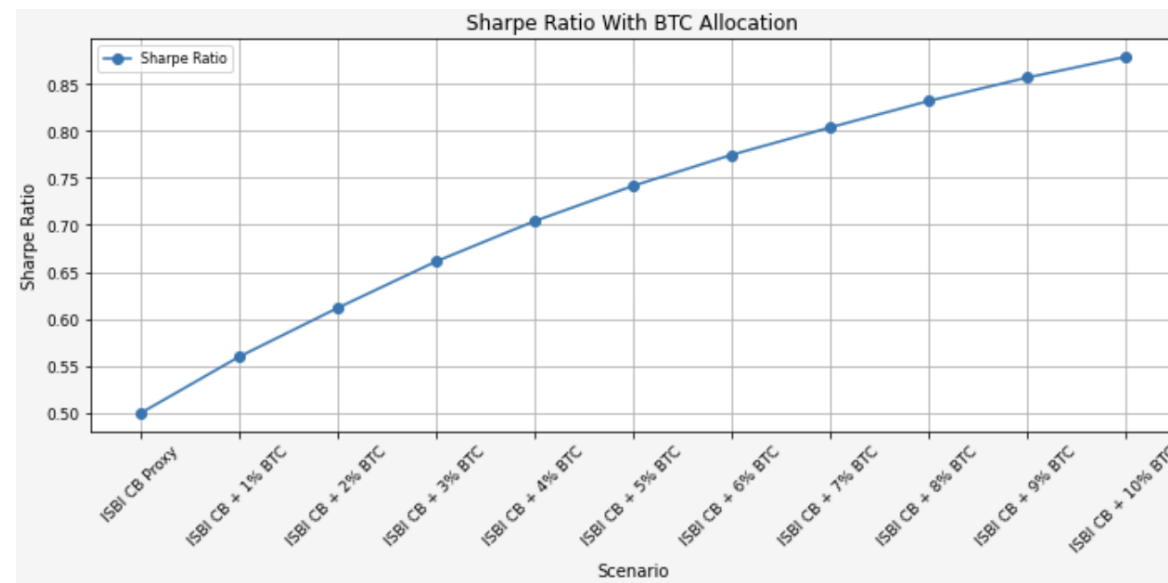
	Expected Return	Expected Volatility	Sharpe Ratio
MVO Without BTC	0.068	0.057	1.199
MVO With BTC	0.113	0.080	1.409

- MVO with BTC allocation produces higher Sharpe Ratio

# Results

	CAGR	Mean Annual Volatility	Sharpe Ratio	Max Drawdown
<b>ISBI CB Proxy</b>	0.055	0.110	0.499	-0.140
<b>ISBI CB + 1% BTC</b>	0.065	0.116	0.559	-0.142
<b>ISBI CB + 3% BTC</b>	0.085	0.129	0.661	-0.146
<b>ISBI CB + 5% BTC</b>	0.106	0.143	0.742	-0.158
<b>ISBI CB + 10% BTC</b>	0.154	0.175	0.879	-0.185

- Mean return and volatility both increase as allocation to Bitcoin also increases
- Greatest increase in Sharpe ratio with adding 1% allocation to BTC



# Conclusion

- Adding Bitcoin to the portfolio appears attractive
  - Improved risk-adjusted returns after addition
  - Low correlation with other asset classes
  - Inflation-hedging nature
- Considerations:
  - Costs (custody or ETF fees)
  - Extra regulatory hurdles for pension funds
  - Tail risk
  - What is the inherent value?