AIM 10 Bitcoin ETFs

On the Struggle to Get It Right

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Bitcoin ETFs

- Context:
  - Traditionally, investment portfolios consist of:
    - Cash equivalents, stocks, and bonds.
      - Occasionally commodities such as gold.
  - Should bitcoin be included as asset class?
    - SEC has rejected applications for spot-based MFs and ETFs.
    - SEC has approved ETFs.

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What is bitcoin?

- Bitcoin is digital asset or cryptocurrency.
- Digital assets–
  - Have intrinsic value of 0.
    - Will never produce earnings, so cannot value by discounting cash flows.
  - Worth what people are willing to pay for it.
    - Value is arbitrary. Analogous to GameStop.
  - Has unique properties.
    - No one can create more it. (e.g., 21 million bitcoins)
    - Can never be censored (only accessed using internet).
    - Hard to confiscate.
    - Was originally established as way to transfer money.

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History of bitcoin ETFs

- July 13, 2013: Winklevoss Bitcoin Trust filed application with SEC to launch first Bitcoin ETF (COIN).
  - SEC rejected application under rule BZK Rule 14.11(e)(4)
  - For an exchange to list and trade shares of an ETF, the exchange:
    - Must have surveillance-sharing agreements with significant markets for trading the underlying commodity or derivatives on that commodity; and,
    - The markets must be regulated.

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History of bitcoin ETFs

- September 27, 2017: ProShares filed an S-1 registration statement for two Bitcoin ETFs.
  - SEC rejected on Aug 22, 2018 based on Exchange Act Section 6(b)(5)—the requirement that a national securities exchange's rules be designed to prevent fraudulent and manipulative acts and practices.
    - SEC also noted that the CBOE had offered no record evidence to demonstrate that the futures markets on which the ETFs would be based were of significant size, which could lead to fraudulent and manipulative acts.

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History of bitcoin ETFs

- October 19, 2021: SEC approved ProShares Bitcoin Strategy ETF.
  - Second generation ETF:
    - Assumes active arbitrage between spot and futures markets.
    - Spot return equals sum of risk-free return and futures return.
- Futures settlement
  - CME CF Bitcoin Reference Index (BRR)
    - Underlies CME bitcoin futures.
    - Transparent
    - Tradable?

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Bitcoin ETF (BITO)

FACT SHEET As of 11/19/2021

BITCOIN STRATEGY ETF

- The fund offers investors a convenient way to incorporate a rapidly growing digital asset into their portfolios as:
  - a complement to stocks and bonds
  - a hedge against inflation
  - an alternative to traditional currency investments
  - a replacement for "real assets" like gold and commodities

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Bitcoin ETF (BITO)

FACT SHEET As of 11/19/2021

BITCOIN STRATEGY ETF

Fund details

Inception Date Trading	10/18/21
Ticker Symbol	BITO
Intraday Symbol	BITO.IV
CUSIP	74347G440
Exchange	NYSE Arca
Net Assets (as of 11/19/2021)	$1.41 billion
Operating Expenses	0.95%

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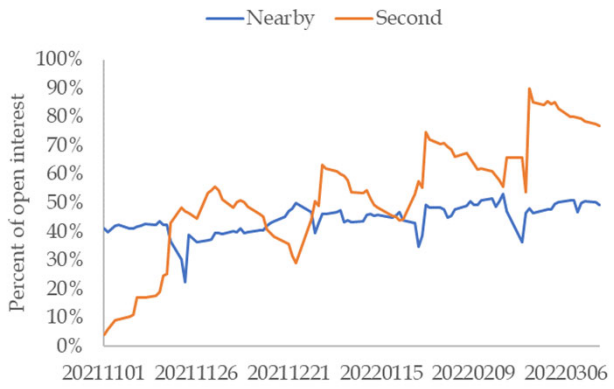
Bitcoin ETF (BITO)

- ProShares dominates CME Bitcoin futures market.



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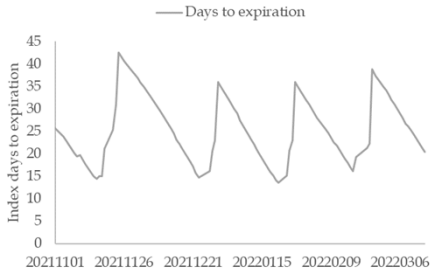
Bitcoin ETF (BITO)

- ProShares does not have defined benchmark.



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Bitcoin ETF (BITO)

- ProShares does not have defined benchmark.
  - Created one.

Summary statistics			
Description	BITO	HW	HW*
n	105	105	105
Mean (daily)	-0.0046	-0.0043	-0.0043
StDev (daily)	0.0399	0.0393	0.0393
Skewness	0.2037	0.1585	0.1585
Autocorrelation	0.0604	0.0628	0.0628
Minimum	-0.1099	-0.1113	-0.1113
Median	-0.0038	-0.0030	-0.0031
Maximum	0.1125	0.1139	0.1139
Mean (annual)	-116.14%	-108.07%	-109.07%
StDev (annual)	63.37%	62.39%	62.39%
CAGR	-68.70%	-66.06%	-66.40%
HPR	-38.36%	-36.26%	-36.52%

Correlation matrix			
	BITO	HW	HW*
BITO	1	0.989	0.989
HW	0.989	1.000	1
HW*	0.989	1	1

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Bitcoin ETF (BITO)

- Bitcoin futures index does not behave like spot bitcoin.

Summary statistics		
Description	BRR	HW
n	1,036	1,036
Mean (daily)	0.0015	0.0011
StDev (daily)	0.0451	0.0459
Skewness	-0.2044	-0.1970
Autocorrelation	0.0187	-0.0239
Minimum	-0.2470	-0.2677
Median	0.0012	0.0002
Maximum	0.2003	0.2224
Mean (annual)	38.73%	28.85%
StDev (annual)	71.61%	72.90%
CAGR	47.31%	33.45%
HPR	391.56%	227.46%

Correlation matrix		
	BRR	HW
BRR	1	0.798
HW	0.798	1.000

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History of bitcoin ETFs

- November 16, 2021: Grayscale announced application to convert its Bitcoin Investment Trust into ETF.

Top Grayscale funds by AUM		
Product	**AUM (MM)**	**Percent**
Grayscale® Bitcoin Trust	$25,646	70.8%
Grayscale® Ethereum Trust	$9,298	25.7%
Grayscale® Ethereum Classic Trust	$453	1.3%
Grayscale® Digital Large Cap Fund	$413	1.1%
Grayscale® Litecoin Trust	$162	0.4%
Total Grayscale AUM	$36,241	

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Grayscale

- CoinDesk Bitcoin Price Index (XBX)
  - Underlies $26B Grayscale Bitcoin Trust (GBTC)
  - Proprietary

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BRR vs GBTC

Summary statistics		
Description	BRR	GBTC
n	1,047	1,047
Mean (daily)	0.0016	0.0007
StDev (daily)	0.0450	0.0542
Skewness	-0.2106	0.0863
Autocorrelation	0.0191	-0.0478
Minimum	-0.2470	-0.2935
Median	0.0012	-0.0010
Maximum	0.2003	0.2173
Mean (annual)	39.70%	18.07%
StDev (annual)	71.47%	85.97%
CAGR	48.73%	19.80%
HPR	420.37%	111.85%

Correlation matrix		
	BRR	GBTC
BRR	1	0.665
GBTC	0.665	1

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Portfolio diversification

Summary statistics					
Description	ETD	IVV	AGG	GLD	BRR
n	1,040	1,040	1,040	1,040	1,040
Mean (daily)	0.0000	0.0006	0.0001	0.0003	0.0016
StDev (daily)	0.0001	0.0135	0.0033	0.0091	0.0452
Skewness	1.7339	-0.9494	-3.2778	-0.4767	-0.2125
Autocorrelation	0.4513	-0.2200	0.0641	0.0552	0.0177
Minimum	0.0000	-0.1230	-0.0408	-0.0552	-0.2470
Median	0.0000	0.0011	0.0002	0.0006	0.0012
Maximum	0.0003	0.0903	0.0234	0.0474	0.2003
Mean (annual)	1.13%	15.09%	2.32%	8.81%	41.16%
StDev (annual)	0.08%	21.37%	5.20%	14.40%	71.71%
CAGR	1.14%	16.29%	2.35%	9.21%	50.92%
HPR	4.78%	86.44%	10.07%	43.86%	446.66%

Correlation matrix					
	ETD	IVV	AGG	GLD	BRR
ETD	1	-0.053	0.025	0.007	0.023
IVV	-0.053	1	0.055	0.048	0.112
AGG	0.025	0.055	1	0.310	0.041
GLD	0.007	0.048	0.310	1	0.091
BRR	0.023	0.112	0.041	0.091	1

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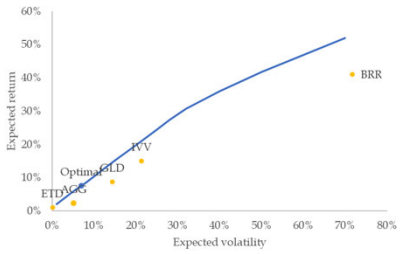
Portfolio diversification



Portfolio allocations at different risk tolerances						
Expected return	Expected volatility	Optimal portfolio weights				
		ETD	IVV	AGG	GLD	BRR
2.07%	1.00%	0.9233	0.0290	0.0076	0.0334	0.0066
5.82%	5.00%	0.6188	0.1449	0.0347	0.1683	0.0333
7.70%	7.00%	0.4606	0.2021	0.0560	0.2344	0.0469
8.48%	8.00%	0.1260	0.4997	0.0000	0.3743	0.0000
10.45%	10.00%	-0.0929	0.6243	0.0000	0.4687	0.0000
12.39%	12.00%	0.0729	0.3470	0.0996	0.4000	0.0805
15.21%	15.00%	-0.1523	0.4332	0.1161	0.5024	0.1006
19.90%	20.00%	-0.5227	0.5773	0.1390	0.6722	0.1343
24.59%	25.00%	-0.8900	0.7225	0.1576	0.8424	0.1676
27.39%	28.00%	-1.0000	0.8099	0.0532	0.4655	0.0000
30.76%	32.00%	-1.0000	0.9181	0.0000	0.9466	0.1902
36.10%	40.00%	-1.0000	1.0845	0.0000	0.8193	0.2626
41.92%	50.00%	-1.0000	1.2674	0.0000	0.1929	0.5397
52.02%	70.00%	-1.0000	1.1190	0.0000	0.0000	0.8810

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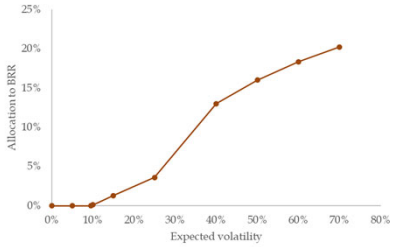
Portfolio diversification



Portfolio allocations at 20% risk tolerance						
Expected return	Expected BRR return	Optimal portfolio weights				
		ETD	IVV	AGG	GLD	BRR
9.38%	0.00%	0.1348	0.3561	0.0973	0.4118	0.0000
9.38%	5.00%	0.1348	0.3561	0.0973	0.4118	0.0000
9.38%	9.50%	0.1341	0.3556	0.0975	0.4127	0.0001
9.38%	10.00%	0.1343	0.3554	0.0973	0.4118	0.0013
9.42%	15.00%	0.1359	0.3495	0.0965	0.4048	0.0133
9.67%	25.00%	0.1571	0.3310	0.0928	0.3829	0.0362
19.74%	40.00%	-0.5414	0.5841	0.1485	0.6784	0.1304
21.20%	50.00%	-0.4378	0.5276	0.1371	0.6128	0.1603
22.93%	60.00%	-0.3344	0.4723	0.1268	0.5516	0.1837
52.02%	70.00%	-0.2295	0.4226	0.1153	0.4892	0.2024

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Lesson summary

- Bitcoin ETFs …

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