

	Mean %	Std %	Skew	Kurt	MD %	MD date
Hedging Instrument						
BTCF	0.39	4.63	-0.51	4.42	-26.99	2020-03-12
Individual Cryptos						
BTC	0.39	4.40	-0.59	4.66	-26.00	2020-03-12
ETH	0.68	6.01	-0.26	5.26	-32.01	2020-03-12
ADA	0.95	6.70	0.17	2.31	-26.85	2020-03-12
LTC	0.32	6.48	-0.99	5.30	-37.59	2021-05-19
XRP	0.30	7.98	0.55	12.49	-52.77	2020-12-23
Crypto Indices with BTC Constituent						
BITX	0.21	4.74	-0.55	4.04	-27.02	2020-03-12
CRIX	0.22	4.70	-0.49	4.16	-27.14	2020-03-12
BITW100	0.22	4.76	-0.63	4.03	-27.27	2020-03-12
Crypto Indices without BTC Constituent						
BITW20	0.18	5.50	-0.90	3.72	-31.01	2020-03-12
BITW70	0.17	5.85	-0.96	4.11	-32.35	2021-05-19

Table 1: Summary Statistics of Assets' Daily Log Returns.

	Mean %	Std %	Skew	Kurt	MD %	MD date	ERM k=10
Individual Cryptos							
BTC	0.0223	0.3221	-1.0008	3.4153	-1.5242	2020-11-30	0.0057
ETH	0.3117	3.8679	1.0345	7.5751	-18.8729	2021-05-19	0.0491
ADA	0.5722	5.3590	1.4203	4.6970	-14.3885	2021-01-08	0.0700
LTC	-0.0512	3.8812	-0.2929	7.7022	-28.0879	2021-05-19	0.0616
XRP	0.0155	7.1579	1.1244	19.8583	-52.5689	2020-12-23	0.0787
Crypto Indices with BTC Constituent							
BITX	0.0590	1.0078	-0.4427	13.0839	-7.8581	2021-05-19	0.0127
CRIX	0.0840	0.9087	0.0488	14.5501	-7.0530	2021-05-19	0.0100
BITW100	0.0853	1.2032	-1.6522	20.5562	-11.1846	2021-05-19	0.0153
Crypto Indices without BTC Constituent							
BITW20	0.2564	3.6009	-0.3446	4.2152	-21.5920	2021-05-19	0.0503
BITW70	0.2818	3.9074	-0.6952	4.8745	-24.5250	2021-05-19	0.0557

Table 2: Summary Statistics of Hedged Portfolios that minimize ERM k=10.

	Mean %	Std %	Skew	Kurt	MD %	MD date	ES 5%
Individual Cryptos							
BTC	0.0204	0.3234	-1.0150	3.4423	-1.5629	2020-11-30	0.0101
ETH	0.3082	3.8890	1.0119	7.4077	-18.7819	2021-05-19	0.0782
ADA	0.5525	5.2673	1.2557	4.2423	-14.9647	2021-05-19	0.0984
LTC	-0.0808	3.9829	-0.4957	7.2302	-28.4608	2021-05-19	0.0962
XRP	0.0176	7.1533	1.1411	19.9176	-52.5698	2020-12-23	0.1354
Crypto Indices with BTC Constituent							
BITX	0.0591	1.0065	-0.3453	12.1335	-7.6211	2021-05-19	0.0215
CRIX	0.0777	0.9207	0.0164	13.5608	-6.9894	2021-05-19	0.0173
BITW100	0.0848	1.2125	-1.6397	19.7472	-11.1357	2021-05-19	0.0274
Crypto Indices without BTC Constituent							
BITW20	0.2608	3.6115	-0.3555	4.2016	-21.5430	2021-05-19	0.0804
BITW70	0.2785	3.9157	-0.6949	4.8047	-24.3474	2021-05-19	0.0908

Table 3: Summary Statistics of Hedged Portfolios that minimize ES 5%.

	Mean %	Std %	Skew	Kurt	MD %	MD date	ES 1%
Individual Cryptos							
BTC	0.014808	0.347559	-0.835432	3.305439	-1.622527	2020-11-30	0.023384
ETH	0.307977	3.895367	0.984009	7.494711	-18.762453	2021-05-19	0.129950
ADA	0.501591	5.404018	1.100767	3.960739	-15.448083	2021-05-19	0.146283
LTC	-0.102863	4.158086	-0.775700	7.437497	-29.172721	2021-05-19	0.164734
XRP	-0.019965	7.288724	1.112146	18.873229	-52.569956	2020-12-23	0.251630
Crypto Indices with BTC Constituent							
BITX	0.059801	1.031183	-0.440995	11.586333	-7.742446	2021-05-19	0.041121
CRIX	0.083524	0.946138	-0.036149	12.404693	-7.020300	2021-05-19	0.034979
BITW100	0.078145	1.263996	-1.964529	21.883557	-11.926340	2021-05-19	0.059302
Crypto Indices without BTC Constituent							
BITW20	0.253793	3.632266	-0.408622	4.446241	-21.986552	2021-05-19	0.128208
BITW70	0.266023	3.932037	-0.759783	5.004985	-24.476390	2021-05-19	0.153457

Table 4: Summary Statistics of Hedged Portfolios that minimize ES 1%.

	Mean %	Std %	Skew	Kurt	MD %	MD date	VaR 5%
Individual Cryptos							
BTC	0.0253	0.3294	-0.9725	3.4373	-1.5347	2020-11-30	0.0063
ETH	0.3084	3.8944	1.0243	7.4297	-19.1750	2021-05-19	0.0514
ADA	0.5726	5.2204	1.2981	4.2544	-14.6974	2021-05-19	0.0769
LTC	-0.0742	3.9145	-0.3836	7.5384	-28.3672	2021-05-19	0.0622
XRP	0.0208	7.1520	1.1269	19.8930	-52.5667	2020-12-23	0.0683
Crypto Indices with BTC Constituent							
BITX	0.0562	0.9930	-0.3117	12.4780	-7.5639	2021-05-19	0.0128
CRIX	0.0863	0.9151	0.0718	13.7915	-6.9744	2021-05-19	0.0092
BITW100	0.0846	1.1980	-1.6592	21.3725	-11.2582	2021-05-19	0.0164
Crypto Indices without BTC Constituent							
BITW20	0.2728	3.5940	-0.3721	4.4896	-22.0733	2021-05-19	0.0546
BITW70	0.2847	3.9133	-0.6580	4.7874	-24.6513	2021-05-19	0.0626

Table 5: Summary Statistics of Hedged Portfolios that minimize VaR 5%.

	Mean %	Std %	Skew	Kurt	MD %	MD date	VaR 5%
Individual Cryptos							
BTC	0.0176	0.3270	-1.0405	3.3742	-1.5689	2020-11-30	0.0134
ETH	0.2977	3.9132	0.9547	7.2414	-18.6061	2021-05-19	0.1026
ADA	0.5562	5.3466	1.1362	3.9334	-15.4795	2021-05-19	0.1106
LTC	-0.0852	4.1503	-0.7234	7.3208	-29.0915	2021-05-19	0.1030
XRP	0.0352	7.1658	1.1582	19.8506	-52.5727	2020-12-23	0.1387
Crypto Indices with BTC Constituent							
BITX	0.0593	1.0178	-0.5331	13.3100	-8.0299	2021-05-19	0.0247
CRIX	0.0738	0.9695	-0.4729	13.6500	-7.0185	2021-05-19	0.0245
BITW100	0.0823	1.2338	-1.9365	23.1938	-11.8752	2021-05-19	0.0347
Crypto Indices without BTC Constituent							
BITW20	0.2499	3.6210	-0.3866	4.3396	-21.6634	2021-05-19	0.0988
BITW70	0.2788	3.9257	-0.7635	5.1288	-24.5294	2021-05-19	0.1147

Table 6: Summary Statistics of Hedged Portfolios that minimize VaR 1%.

	Mean %	Std %	Skew	Kurt	MD %	MD date	VaR 5%
Individual Cryptos							
BTC	0.0176	0.3270	-1.0405	3.3742	-1.5689	2020-11-30	0.0134
ETH	0.2977	3.9132	0.9547	7.2414	-18.6061	2021-05-19	0.1026
ADA	0.5562	5.3466	1.1362	3.9334	-15.4795	2021-05-19	0.1106
LTC	-0.0852	4.1503	-0.7234	7.3208	-29.0915	2021-05-19	0.1030
XRP	0.0352	7.1658	1.1582	19.8506	-52.5727	2020-12-23	0.1387
Crypto Indices with BTC Constituent							
BITX	0.0593	1.0178	-0.5331	13.3100	-8.0299	2021-05-19	0.0247
CRIX	0.0738	0.9695	-0.4729	13.6500	-7.0185	2021-05-19	0.0245
BITW100	0.0823	1.2338	-1.9365	23.1938	-11.8752	2021-05-19	0.0347
Crypto Indices without BTC Constituent							
BITW20	0.2499	3.6210	-0.3866	4.3396	-21.6634	2021-05-19	0.0988
BITW70	0.2788	3.9257	-0.7635	5.1288	-24.5294	2021-05-19	0.1147

Table 7: Summary Statistics of Hedged Portfolios that minimize VaR 1%.

	Var	ES5	ES1	VaR5	VaR1	ERM
BTC	99.31 (98.40, 99.86)	99.25 (98.34, 99.82)	99.27 (98.12, 99.86)	99.25 (98.46, 99.78)	99.28 (98.28, 99.86)	99.30 (98.23, 99.86)
CRIX	95.02 (85.98, 98.52)	95.04 (87.00, 98.86)	95.22 (83.30, 97.91)	95.04 (86.04, 98.67)	95.07 (85.40, 98.62)	95.01 (84.14, 98.70)
BITX	94.84 (84.37, 98.28)	94.70 (73.72, 98.14)	94.67 (82.33, 97.78)	94.77 (83.14, 97.77)	94.77 (77.69, 97.98)	94.80 (78.11, 98.48)
BITW100	92.07 (73.32, 98.54)	92.60 (73.45, 97.38)	92.93 (77.25, 97.29)	92.61 (69.38, 97.66)	92.98 (76.04, 97.52)	92.98 (76.85, 97.33)
BITW20	43.55 (-30.18, 79.60)	45.23 (-68.19, 82.07)	44.97 (-85.52, 83.94)	44.96 (-31.97, 73.62)	45.23 (-48.61, 80.95)	45.03 (-8.90, 77.35)
BITW70	56.04 (0.15, 88.03)	50.02 (24.05, 85.20)	50.62 (15.39, 79.82)	51.53 (26.59, 82.52)	55.96 (0.33, 87.92)	51.08 (15.67, 85.45)
ADA	25.68 (-28.78, 77.79)	24.84 (-16.57, 66.57)	23.64 (-29.80, 69.98)	31.36 (-7.76, 66.96)	29.82 (-9.47, 63.61)	29.52 (-20.61, 73.02)
ETH	52.37 (-3.42, 77.97)	50.11 (-33.27, 79.83)	52.18 (-31.37, 76.85)	51.37 (-20.98, 79.51)	51.96 (-10.88, 77.82)	52.01 (-22.41, 77.25)
LTC	63.44 (13.20, 79.49)	63.98 (24.15, 78.81)	62.60 (-4.69, 82.24)	62.66 (17.31, 80.70)	61.91 (20.63, 77.07)	61.56 (10.01, 77.70)
XRP	8.74 (-96.85, 64.17)	9.77 (-59.11, 58.79)	7.93 (-138.77, 67.92)	13.31 (-32.20, 65.09)	15.75 (-60.90, 62.55)	17.47 (-37.66, 66.10)

Table 8: BTCF’s Hedging Effectiveness to various assets generated by variance as risk reduction objectives.

	Var	ES5	ES1	VaR5	VaR1	ERM
BTC	89.53 (76.12, 96.61)	89.61 (74.80, 96.50)	90.06 (72.73, 96.08)	89.28 (72.48, 97.00)	89.56 (76.06, 97.11)	89.70 (76.21, 96.82)
CRIX	82.86 (17.60, 94.06)	83.88 (28.77, 96.97)	82.61 (17.49, 93.35)	83.00 (17.42, 94.86)	83.88 (17.68, 98.17)	83.87 (17.64, 96.71)
BITX	79.13 (14.24, 94.51)	79.43 (12.27, 95.93)	79.06 (7.56, 95.92)	80.48 (15.20, 97.22)	79.66 (17.52, 95.62)	79.09 (14.24, 94.82)
BITW100	76.72 (-16.03, 96.39)	76.93 (-13.96, 97.50)	77.19 (5.03, 95.69)	77.01 (-14.42, 97.38)	76.98 (-12.81, 97.04)	78.02 (43.40, 97.40)
BITW20	33.23 (-38.83, 118.59)	33.88 (-33.00, 92.83)	35.32 (-34.89, 130.64)	31.88 (-20.74, 104.16)	33.11 (-35.13, 86.43)	39.18 (0.14, 83.71)
BITW70	38.80 (-66.27, 99.80)	34.20 (-32.09, 90.66)	34.52 (-36.15, 91.29)	32.31 (-25.36, 83.22)	33.95 (-25.07, 91.86)	34.20 (-32.02, 88.59)
ADA	24.94 (-63.48, 60.88)	24.39 (-55.58, 52.86)	22.17 (-69.28, 59.55)	25.83 (-69.95, 54.54)	24.59 (-74.04, 68.74)	18.41 (-124.65, 75.89)
ETH	35.67 (-81.90, 74.46)	36.95 (-122.44, 69.69)	36.61 (-40.06, 70.90)	37.17 (-104.62, 73.28)	36.44 (-161.21, 71.94)	37.07 (-135.54, 72.57)
LTC	45.22 (-33.52, 68.60)	44.53 (-15.71, 65.71)	41.72 (-41.54, 64.15)	43.75 (-17.77, 64.35)	45.08 (-35.28, 67.23)	43.84 (-22.45, 63.83)
XRP	11.98 (-46.99, 48.36)	5.62 (-61.93, 46.20)	30.89 (-41.34, 54.99)	13.41 (-34.40, 47.49)	17.99 (-49.67, 47.69)	16.35 (-40.29, 46.29)

Table 9: BTCF's Hedging Effectiveness to various assets generated by ES5 as risk reduction objectives.