

# DAILY RETURN DISTRIBUTION STATISTICAL ANALYSIS - ETH

August 2023



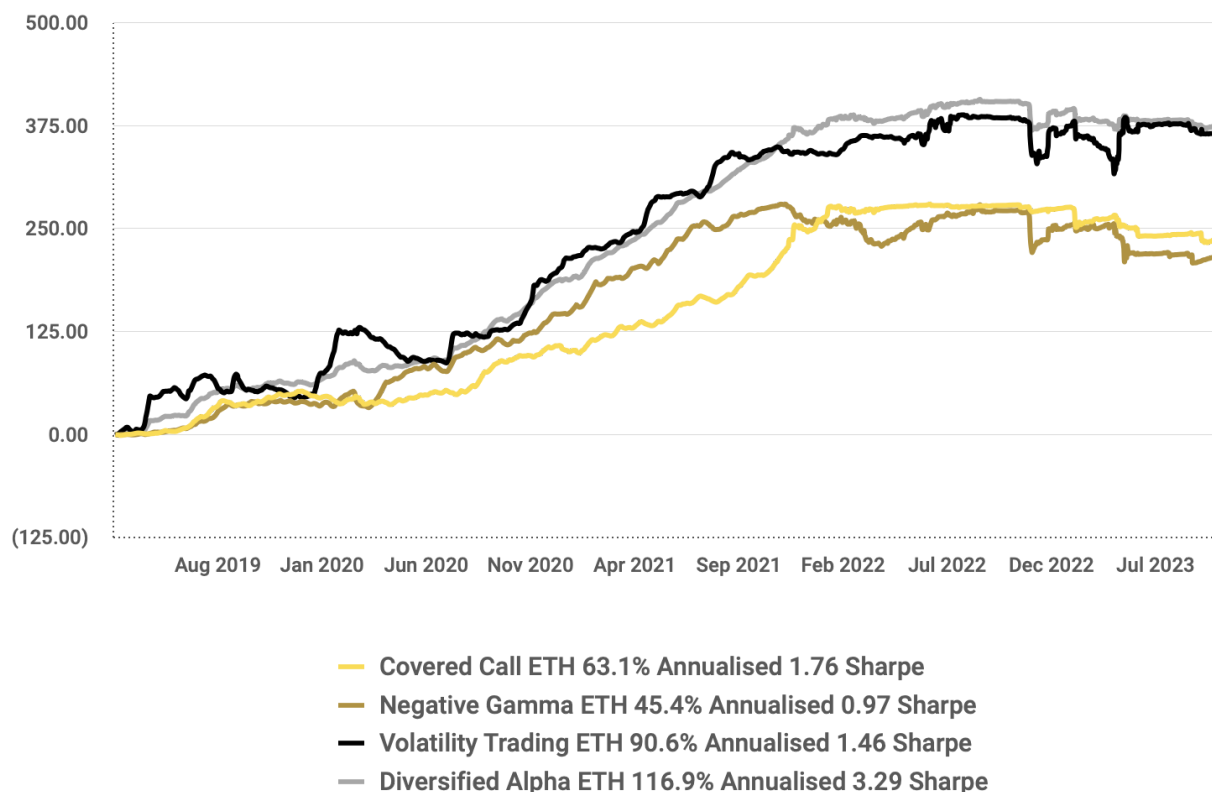
  
LIBERTYROAD  
CAPITAL

Founded in 2019, LibertyRoad Capital is a world class digital asset manager, specialising in yield enhancement strategies for digital currencies, especially Bitcoin. The team has decades of experience in asset management, investment banking and digital and blockchain business.

LibertyRoad Capital offers four ETH strategies:

1. **Covered Call ETH** - uses zero leverage where the USD principal is 100% protected, and the BTC balance is 95% protected.
2. **Negative Gamma ETH** - utilises up to 3x leverage, trading the bitcoin volatility surface with a directional bias depending on fundamental blockchain analysis.
3. **Volatility Trading ETH** - buys and sells bitcoin calls and puts, arbitrages the volatility surface and arbitrages across products and across exchanges.
4. **Diversified Alpha ETH** - is a blend of the 3 other ETH strategies and offers the best risk adjusted returns.

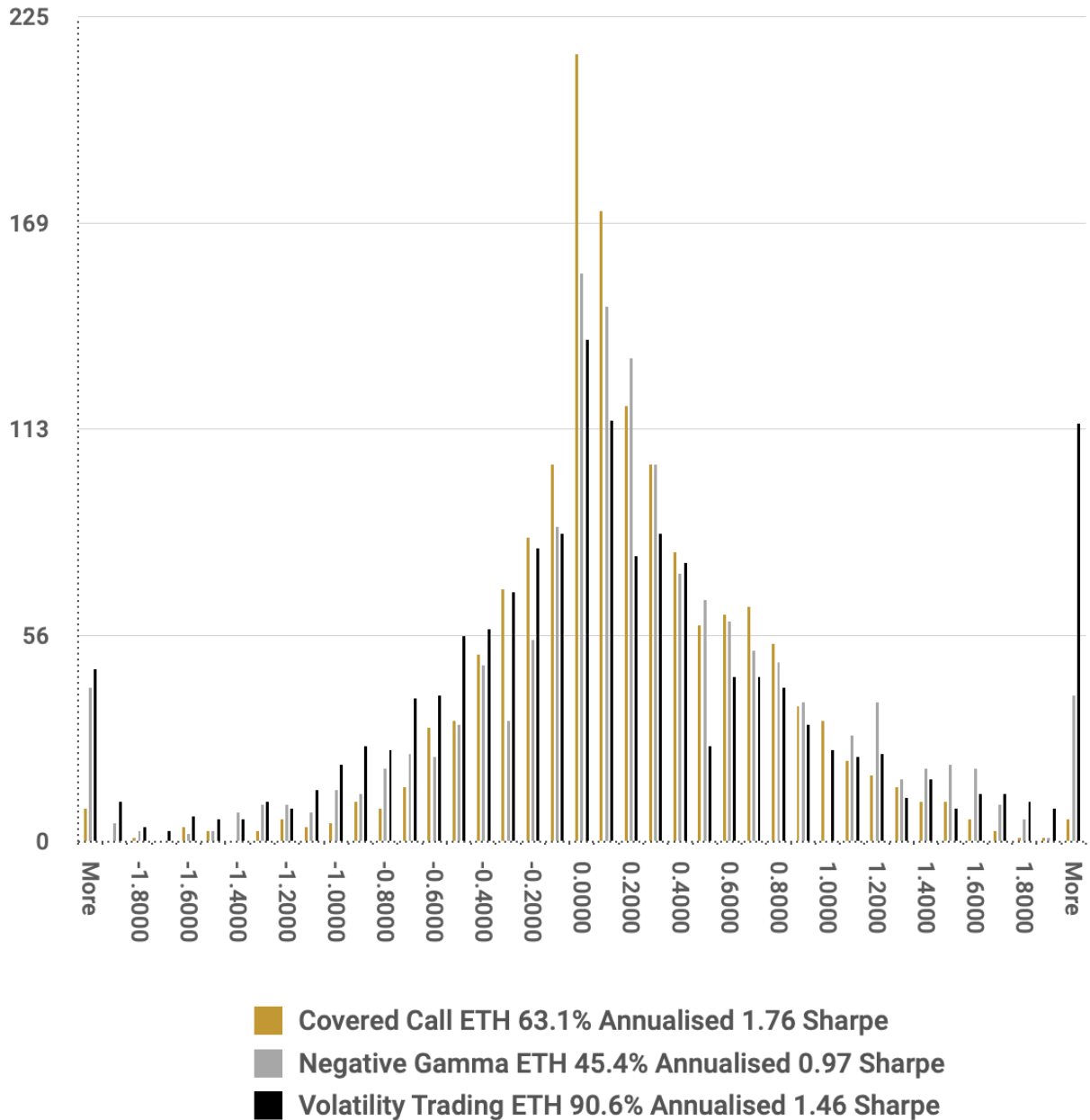
## Cumulative Daily Returns - LibertyRoad ETH Programmes



The chart above shows cumulative daily returns since April 2019. Returns are generated using a targeted level of Extreme Value at Risk (EVaR) which is a sophisticated methodology that models the tail risk and incorporates an estimate of tail risk into the portfolio modelling.

A given level of EVaR is targeted over the year, with actual EVaR being calculated and modelled in real time. Therefore, where market conditions are positive from a Risk Adjusted Return perspective, targeted EVaR will be higher, and when conditions are detrimental targeted EVaR will be lower.

## Overlaid Daily Return Distributions



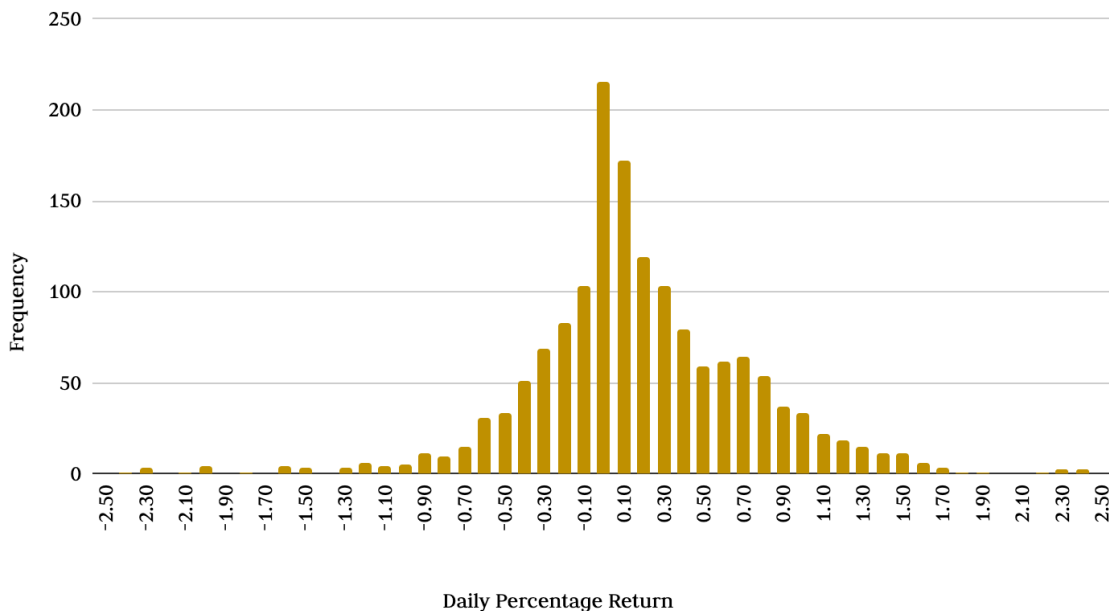
Above are the historical distribution of returns for each strategy.

The Covered Call Strategy employs zero leverage and has returns highly condensed around the mean. It averages 15 bp of daily returns with a daily standard deviation of 0.95.

The Negative Gamma Strategy generates on average 13.5 basis points of returns each day, with a daily standard deviation of 1.45. The Volatility Trading Strategy generates on average 23 basis points of return each day with a Standard Deviation of 1.90.

The Volatility Trading Strategy is significantly skewed to the upside in its distribution of returns. This is because while it sells both puts and calls, it also buys options, which on highly volatile days limits downside and skews the upside significantly higher.

## Covered Call ETH- Daily Distribution of Returns



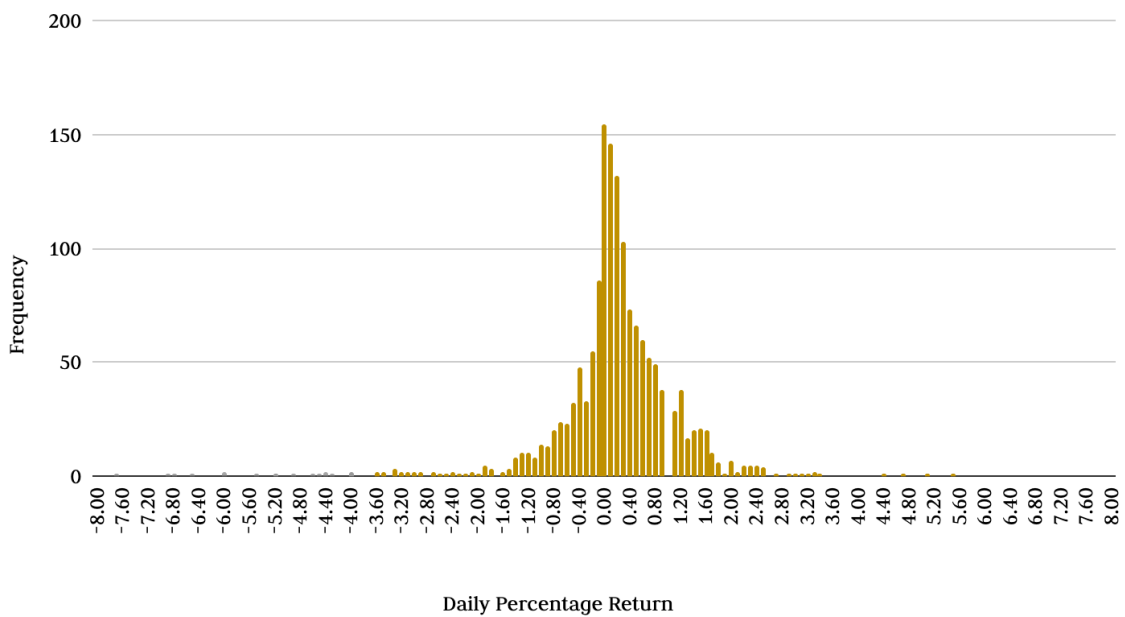
Mean	0.1497
Standard Error	0.02399767587
Median	0.1100
Standard Deviation	0.9547939107
Sample Variance	0.911631412
Kurtosis	-1366.530235
Skewness	-5.28373478
Range	27.67
Minimum	-18.69

Maximum	8.98
Sum	237.0068
Count	1583
Confidence Level (95.0%)	0.04707059296

The Covered Call Strategy is capped at 1x leverage. Therefore, it cannot sell more calls than are invested. It targets 10 bp of return a day and is constantly short gamma and long theta, receiving premium every day. It has the closest distribution to a normal distribution and has returned 63.1% annualised return with a Sharpe Ratio of 1.76.

The largest drawdown occurred on the 13/14<sup>th</sup> of January 2023 with a 18.69% drawdown when Ethereum moved from 18.8k to around 21k.

## Negative Gamma ETH- Daily Distribution of Returns



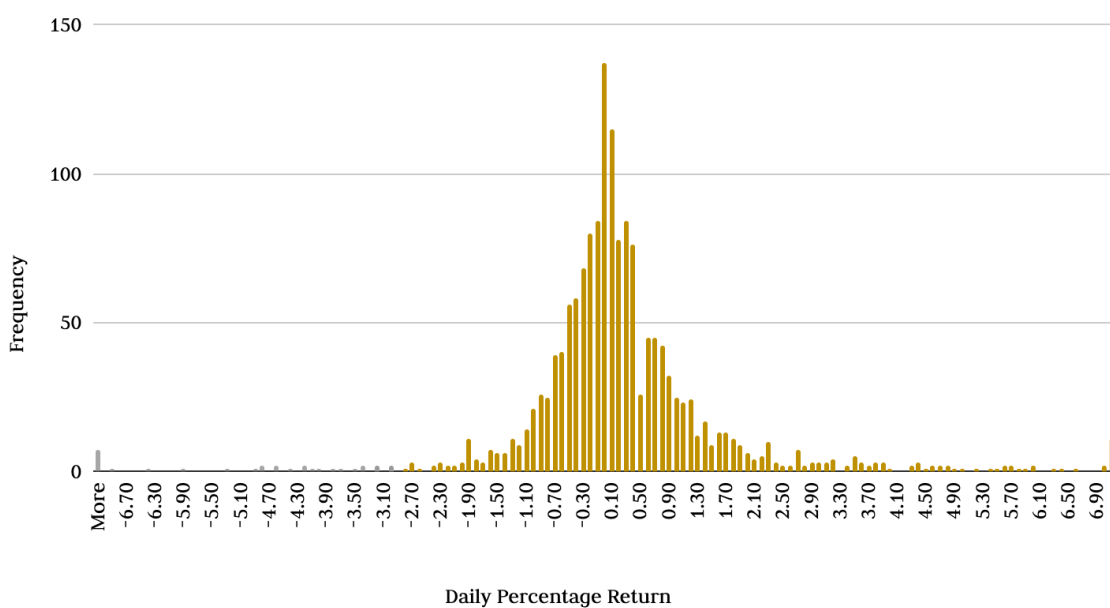
Mean	0.1361
Standard Error	0.03660292585
Median	0.1772
Standard Deviation	1.45447703

Sample Variance	2.115503431
Kurtosis	-596.5690656
Skewness	-3.373166912
Range	34.29
Minimum	-19.48
Maximum	14.81
Sum	214.9502
Count	1579
Confidence Level (95.0%)	0.07179548456

The Negative Gamma Strategy is capped at 3x leverage. However it targets 24 bp of return a day which is roughly equivalent to 2x leverage. It is constantly short gamma and long theta, receiving premium every day. It sells both puts and calls, and is directional based on fundamental and technical analysis in our AI Machine Learning algorithm. It has returned 45.4% annualised with a Sharpe Ratio of 0.97.

The largest drawdown occurred on the 9<sup>th</sup> of November 2022 with a -19.48% drawdown when Ethereum moved from 18.5k to around 15.8k.

## Volatility Trading ETH- Daily Distribution of Returns



Mean	0.23110
Standard Error	0.04784356341
Median	0.08000
Standard Deviation	1.903548629
Sample Variance	3.623497384
Kurtosis	-445.2025488
Skewness	0.7473607133
Range	42.33
Minimum	-21.12
Maximum	21.21
Sum	365.8332
Count	1583
Confidence Level (95.0%)	0.09384345847

The Negative Gamma Strategy is capped at 3x leverage. However, it targets 24 bp of return a day which is roughly equivalent to 2x leverage. It is constantly short gamma and long theta, receiving premium every day. It sells both puts and calls, and is directional based on fundamental and technical analysis in our AI Machine Learning algorithm. It has returned 90.6% annualised return with a Sharpe Ratio of 1.46.

The largest drawdown occurred on the 13/14<sup>th</sup> of January 2023 with a 21.12% drawdown when Ethereum moved from 18.8k to around 21k.