



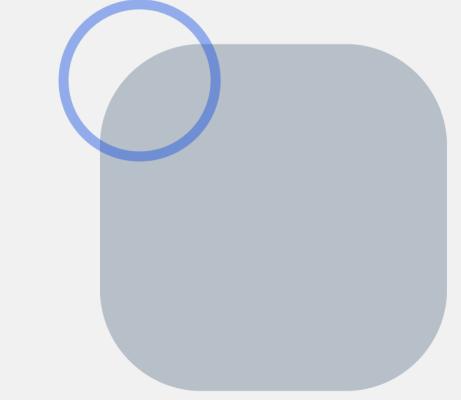
A QUANTITATIVE APPROACH TO EXPLOITING MEAN-REVERTING SPREAD OPPORTUNITIES

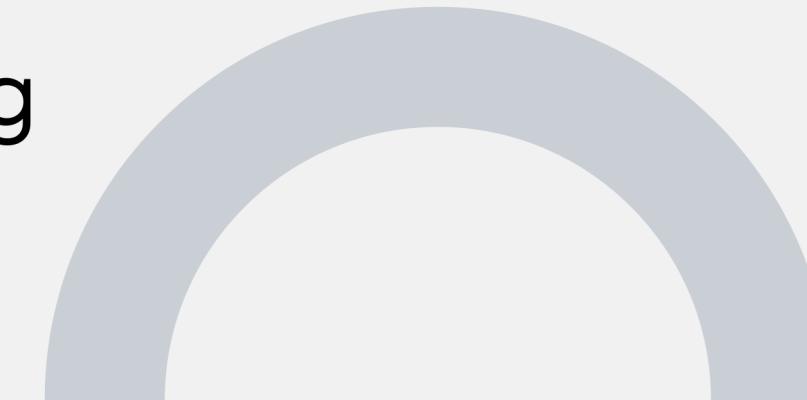
ETH / USDT PAIRS TRADING
STRATEGY





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OVERVIEW

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Cointegration:

A statistical property of time series where the difference between two series is mean-reverting.

Mean-reversion:

The tendency of a time series to return to its historical average.

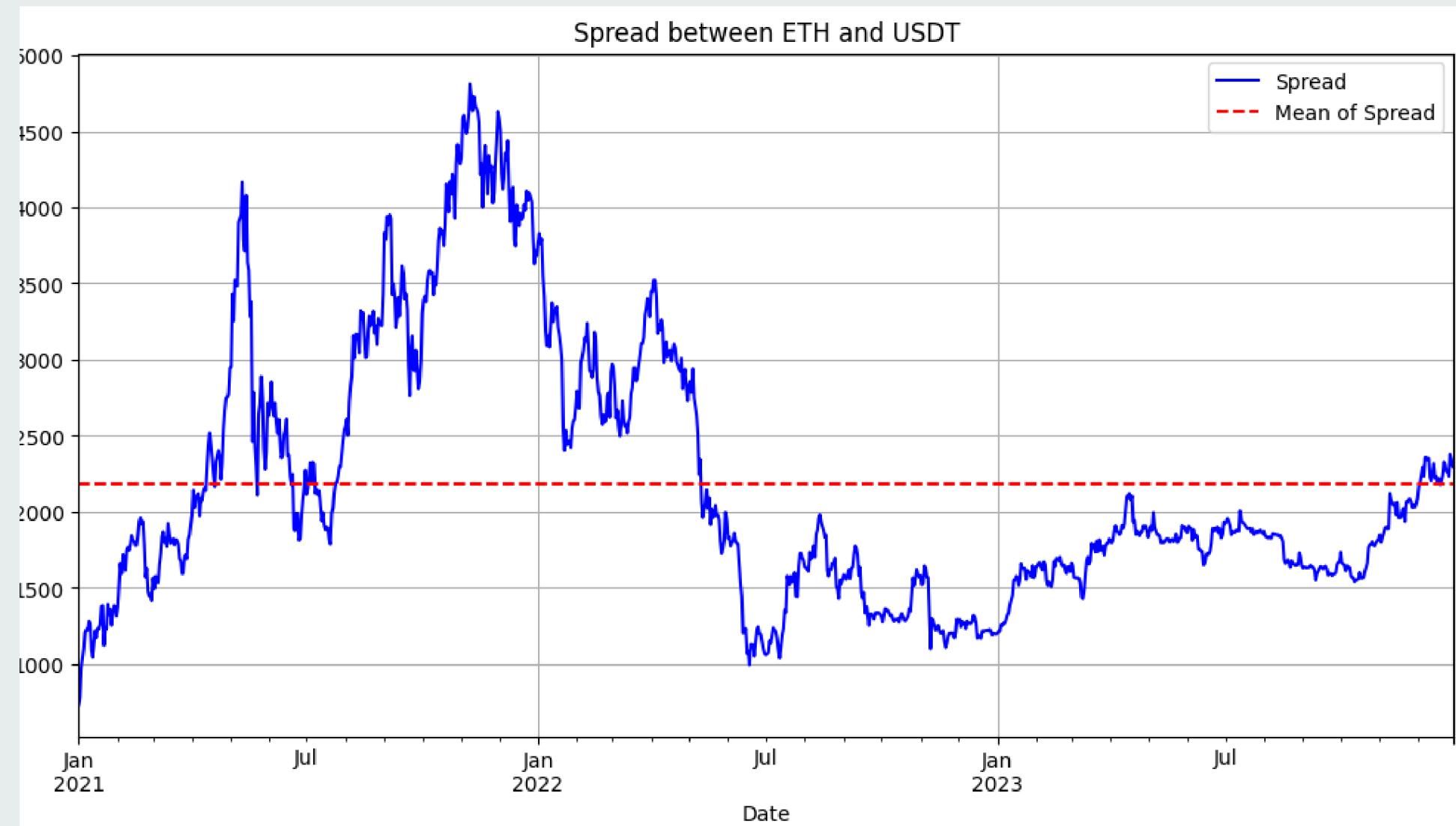


STRATEGY FOR CO - INTEGRATED ASSETS ETH / USDT



CO - INTEGRATION ANALYSIS :-

- This is used to test for the presence of cointegration between multiple time series. The test is based on the concept of vector autoregression models, which are used to model the relationships between multiple time series.
- P-value represents the probability of observing the test statistic under the null hypothesis of no cointegration.
- P-value for ETH/USDT market is 0.0318. Large p-value (greater than 0.05) indicates that the null hypothesis of no cointegration cannot be rejected.



- SPREAD CALCULATION :-
Compute the difference between the prices of the two assets to create a spread series.

Z - SCORE



SIGNIFICANCE

Z-score is a statistical measure that indicates how many standard deviations an observation is away from the mean. In the context of pairs trading, the Z-score is used to determine the significance of the spread deviation from its historical average.



RANGE

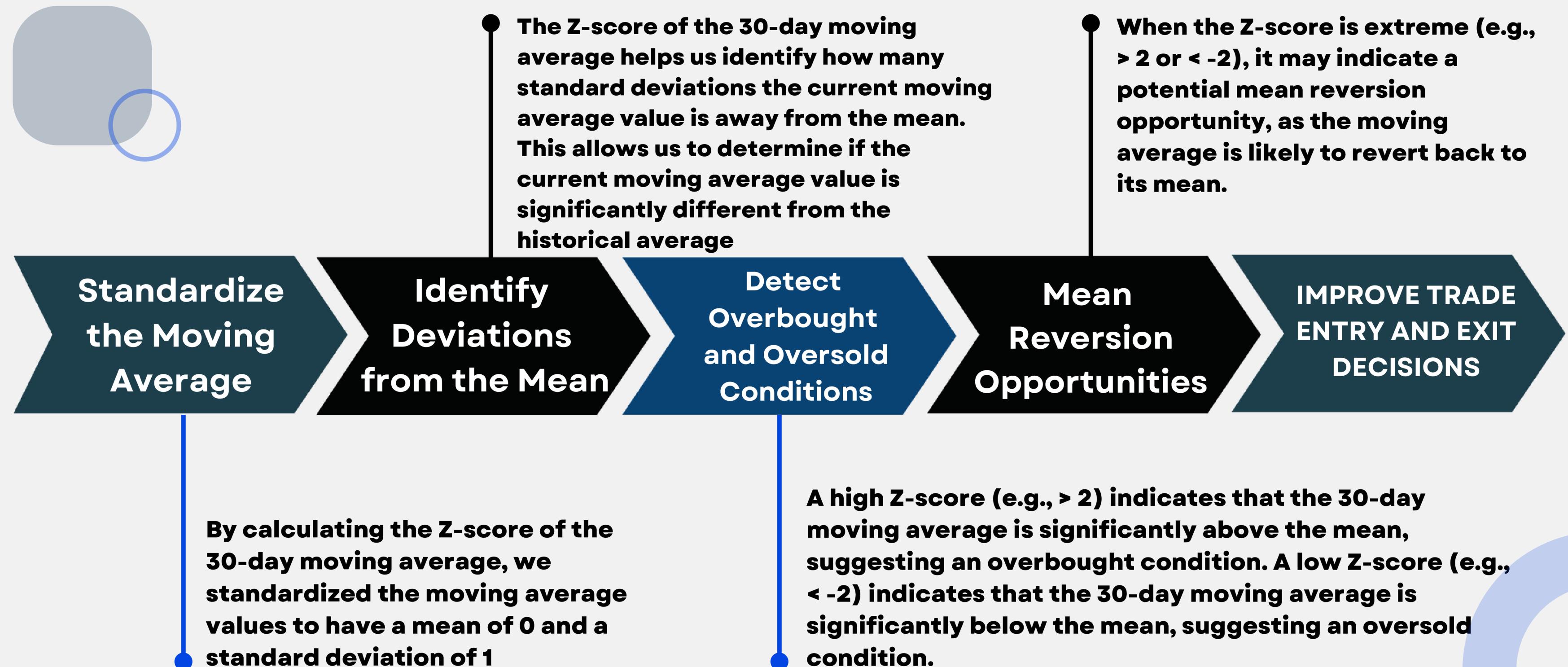
- A high Z-score (e.g., 1 or higher) indicates that the spread is significantly deviated from its mean, suggesting a potential trading opportunity. A low Z-score (e.g., -1 or lower) indicates that the spread is close to its mean, suggesting that the trade is not attractive.



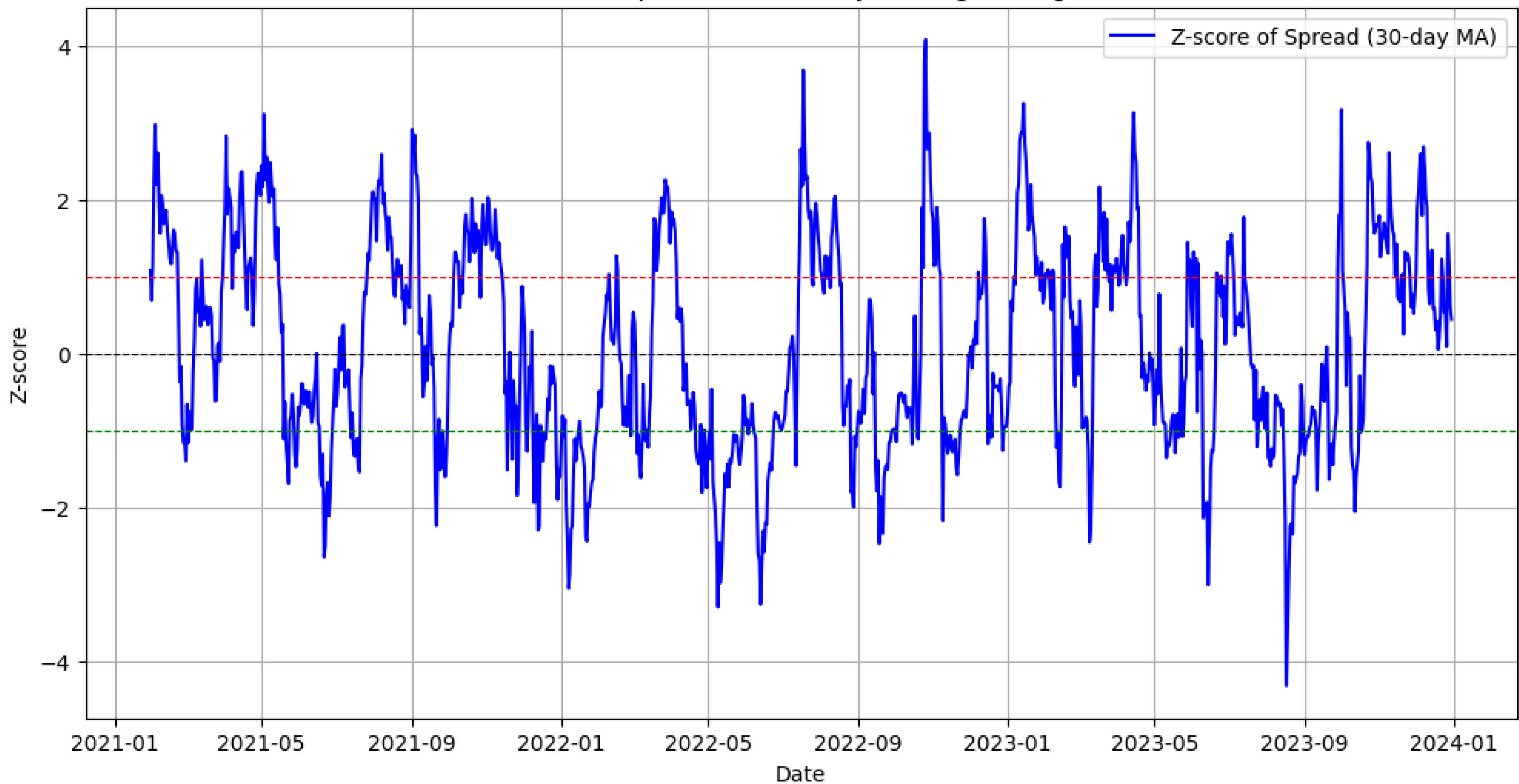
ENTRY AND EXIT CONDITIONS

- In our strategy, we use the Z-score to determine the entry and exit points for our trades. For example, we may enter a trade when the Z-score exceeds 2, indicating a significant deviation from the mean, and exit the trade when the Z-score falls below 1, indicating a return to the mean.

Z - SCORE OF 30 DAY MOVING AVERAGE



Z-score Spread with 30-day Moving Average





WHY 30 - DAY MOVING AVERAGE ?

- We chose a 30-day moving average because it provides a reasonable balance between short-term and long-term trends. A shorter moving average (e.g., 10-day) may be too sensitive to short-term fluctuations, while a longer moving average (e.g., 60-day) may be too slow to respond to changes in the trend.



RISK MANAGEMENT APPROACH



Our risk management approach is designed to mitigate risks and ensure that our strategy remains profitable in various market conditions.

POSITION SIZING

We use a fixed position sizing of 200.00 USDT per trade. This ensures that our exposure to each trade is consistent and manageable, allowing us to maintain a stable risk profile.

STOP -LOSS DISTANCE

We set a stop-loss distance of 400.00 USDT to limit our potential losses in case a trade does not move in our favor. This stop-loss distance is carefully chosen to balance risk management with the need to allow trades to breathe and move in our favor.

DYNAMIC HEDGING

We adjust the hedge ratio based on changes in market conditions or the cointegration relationship between the two assets. This involves continuously monitoring the spread and adjusting the hedge ratio to maintain an optimal risk-return profile.

AVOIDING OVER - FITTING



IN - SAMPLE PERIOD

The Augmented Dickey-Fuller (ADF) test statistic value of -2.5 suggests that the model is well-specified and captures the underlying patterns in the data.



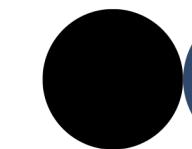
OUT - OF - SAMPLE PERIOD

The ADF test statistic value of -1.5 indicates a moderately mean reverting time series.



NO - OVERRFITTING

A moderately mean reverting statistic value suggests that the model is not overfitting the data, which is a positive sign for the robustness of our trading strategy.



NO NEED FOR MODEL ADJUSTMENT

Since the moderately mean reverting statistic value is considered good, there is no need to adjust the model or add complexity to improve its performance. The moderately mean reverting result suggests that the data quality is good, and there is no need to worry about issues like data snooping or overfitting.