Back Testing Metrics

1. Sharpe Ratio 计算收益和风险比率。表示每承受一单位总风险，会产生多少的超额报酬。

Sharpe Ratio =

= [投资组合的预期报酬率-无风险利率]/投资组合标准差

Sharpe Ratio is the average return earned in excess of the risk-free rate per unit of volatility or total risk. It measures the return of an investment compared to its volatility. The higher the ratio, the better the performance.

1. Yield /Annualized Returns （年化收益率）

Yield measures the profitability of a strategy. Yield does not indicate any information about the volatility.

1. Return (Strategy)

After users choose the time frame, on the last day data point, they can see how their strategy performs.

1. Market

Comparing to the selected strategy, users can see how the market performs.

1. Difference of the return and the market: Strategy return -market return
2. Market Annualized Returns

Benchmark Return =( )^(252/n) -1

Market annualized return is set as a comparison to strategy annualized returns. Based on the comparison, users are able to grasp a clear sense of how well their strategy is performed within a year.

1. Alpha:

Alpha measures the return of an investment by taking risks into consideration. A positive alpha indicates that the strategy used performs better than that was expected based on the risk the user took with the money as measured by the fund beta. The higher the better

1. Beta:

In terms of the back testing, here beta indicates the volatility, or systematic risk, of an individual strategy when comparing to the unsystematic risk of the market. indicates how far the market data points spread out from the average value.

A positive beta means the strategy moves the same direction with benchmark. For example, when beta is 1.3, this indicates that when the market increase by 1%, selected strategy will bring 1.3% return.

Limitations: Beta is less useful when users are looking into future predictions as it is calculated based on historical data. It is less meaningful for long-term strategy since the volatility can vary largely year by year.

1. Max Drawdown

Maximum drawdown is the maximum observed loss from a peak to a trough of a portfolio. It is expressed in percentage terms and measures the size of largest loss. However, this does not take the frequency of large losses into consideration. MDD doesn’t show how long it takes investors to recover from the loss either.

MDD is most suitable for measuring users’ capital preservation and comparing one strategy to another.