

Strategy Performance Report

Chenyu Wang cw2945

Contents

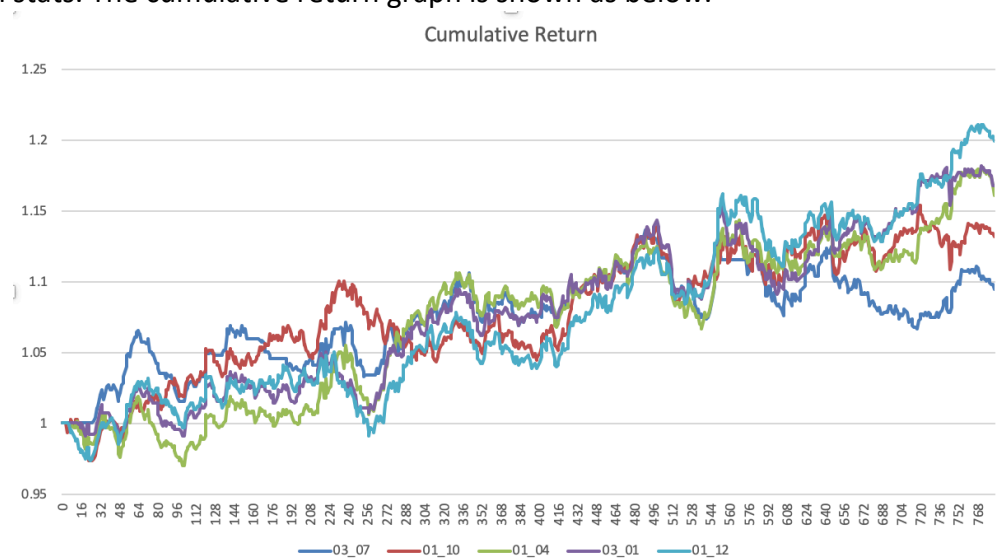
1.Introduction	2
2.Strategy Stats Display	3
3.Strategy Stats Stability Analysis	3
3.1 Annual Return	3
3.2 Annual Volatility	4
3.3 Sharpe Ratio	4
3.4 Sortino Ratio	5
3.5 Calmar Ratio	6
3.6 Information Ratio.....	6
3.7 Max Drawdown.....	7
3.8 Win Ratio	7
4.Conclusion	8

1.Introduction

How to find out whether a strategy is good or not is a common problem that quant traders need to solve in their work. Many famous indicators were raised in the past few decades. Some traders want to know the profitability of the strategy, they will focus mainly on indicators such as annual return, Sharpe ratio, information ratio and Calmar ratio. While some of the traders only care about stability of the strategy, so they pay more attention on max drawdown, annual volatility and win ratio.

However, in a long period, a single number of the stats are not pervasive because it only shows a specific situation in a specific period. What will the stats on other periods? Will it be volatile if we change the time window? Thus, the persistent of the stats should also be considered when we make judge whether a strategy is good or not. By applying sliding window process, we find that the conclusion is slightly different from what we can get directly form the stats on the whole dataset.

Here we have five strategies (03_07, 01_10, 01_04, 03_01, 01_12) and we want to rank them based on stats. The cumulative return graph is shown as below.



2.Strategy Stats Display

In the table below, we show all of the stats listed above of each strategy.

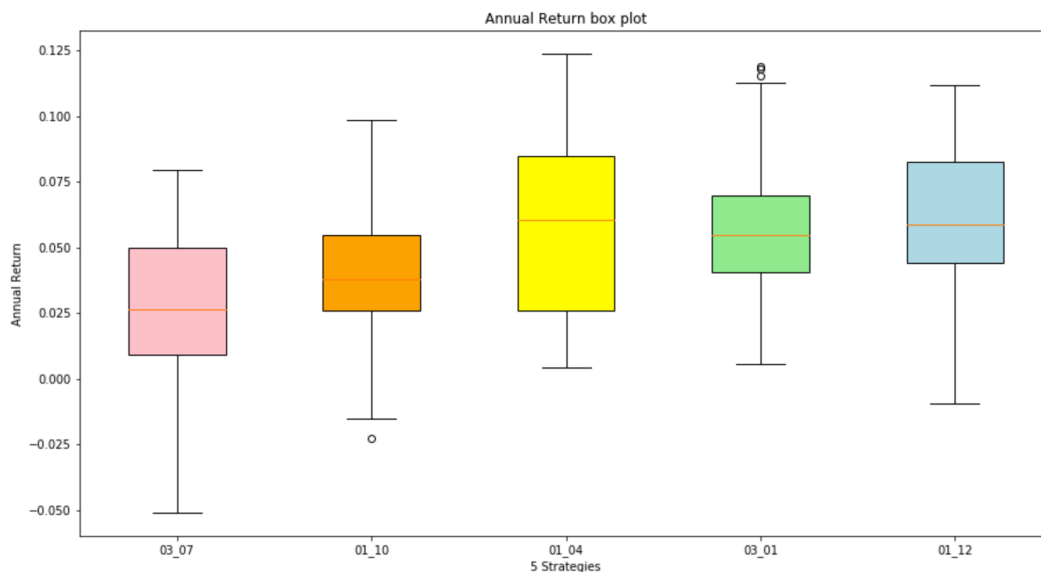
	Annual Return	Annual Volatility	Sharpe Ratio	Sortino Ratio	Calmar Ratio	IR	Max Drawdown	Win Ratio
03_07	0.029	0.054	0.254	0.317	0.245	0.326	0.120	0.401
01_10	0.040	0.061	0.403	0.625	0.258	0.375	0.157	0.507
01_04	0.049	0.061	0.543	0.738	0.276	0.441	0.178	0.506
03_01	0.051	0.055	0.643	0.863	0.312	0.465	0.164	0.458
01_12	0.060	0.059	0.750	1.047	0.307	0.510	0.196	0.504

In the table, we can find that strategy 01_12 has the best annual return, Sharpe ratio and information ratio. Although this strategy has the largest drawdown here, we still think it's the best strategy because the risk is compensated well. Although strategy 03_07 has the lowest drawdown, its profitability is rather low compared with other strategies.

3.Strategy Stats Stability Analysis

We set our window as 252 days and move forward day by day. All my analysis below are based on those Stats series. Here, we care more about the distribution of those Stats.

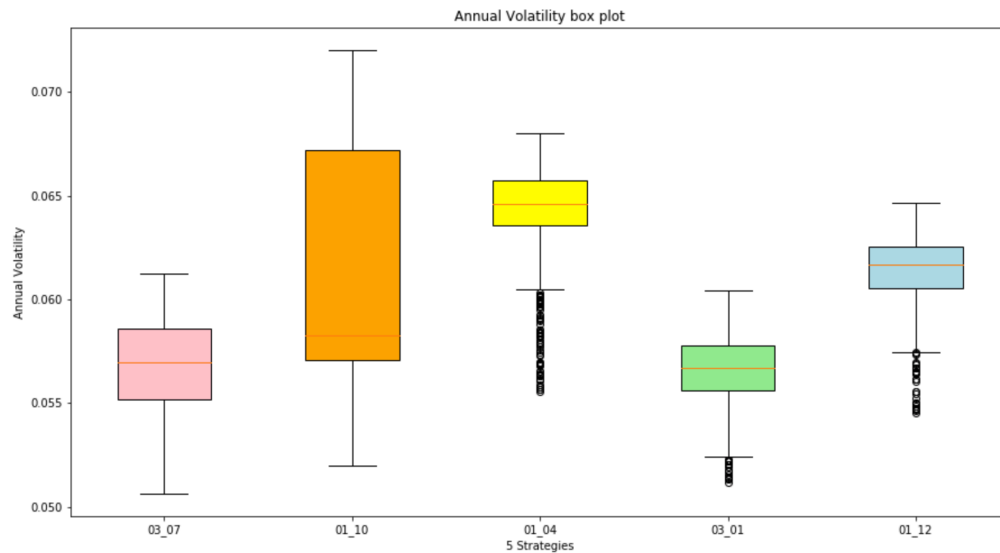
3.1 Annual Return



For strategy 03_07, the annual return is the lowest among the five strategies. The range of the annual return is also the largest. So, we can conclude that the return of this strategy is volatile and the profitability is rather low. Strategy 01_10 is much more stable, but the median is much lower than the rest three strategies. Strategy 01_04 seems to have the highest average annual return but it's too volatile and its average does not exceed the rest two strategies too much. Based on this graph, 03_01 should be the best one because it's much more stable than 01_12 and the average is almost the same.

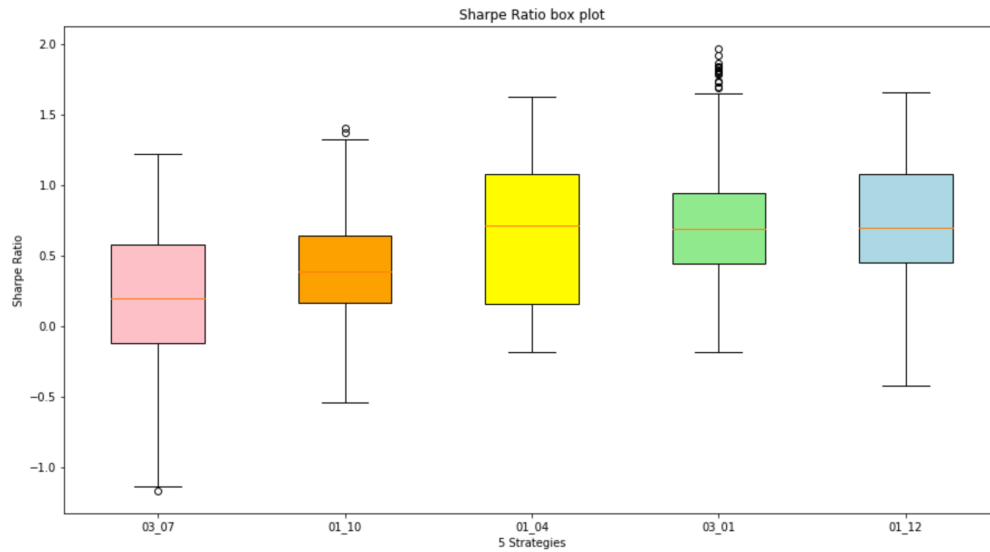
3.2 Annual Volatility

For strategy 01_12, the average volatility is much higher than strategy 03_01. Annual volatility for strategy 01_10 should be the most volatile. It's hard to make some decisions only based on annual volatility because we should analysis the stability together with profitability. So we will focus more on ratios in the following parts.



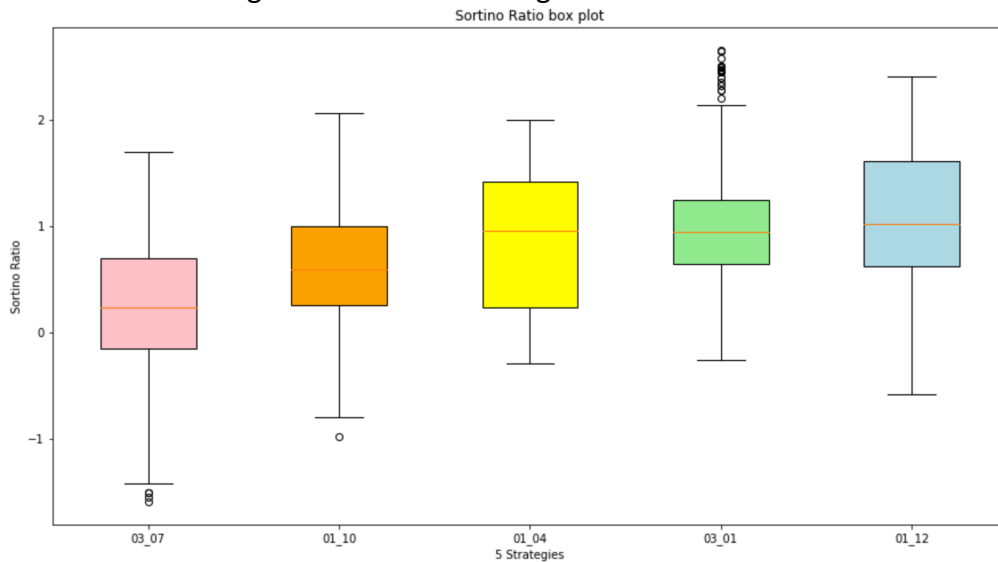
3.3 Sharpe Ratio

Sharpe ratio is a very important stats because it measures how much excess return can be earned if we take a unit of risk. In another word, it shows how well the risk is compensated in this strategy. So, we wish our Sharpe ratio as high as possible. Also, we hope that Sharpe ratio can keep as a high point no matter how we move the window. According to the graph below, we can find that the strategy 03_01 not only has a higher average Sharpe ratio it also performs in a more stable way compared to strategy 01_12. As we expected, strategy 03_07 has the lowest average Sharpe ratio. Strategy 01_10 and 01_04 behaves better than strategy 03_07 but worse than strategy 03_01 and 01_12.



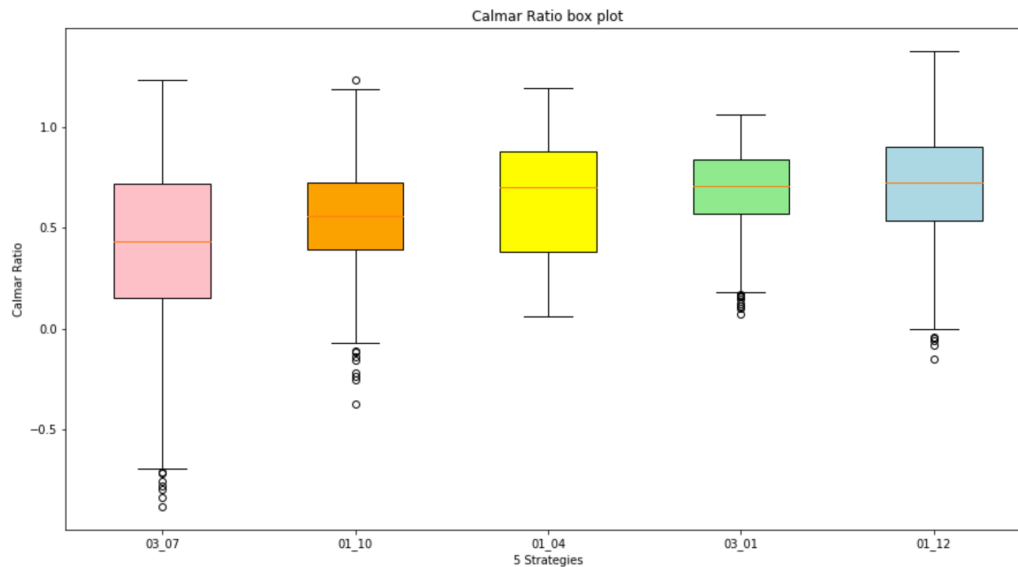
3.4 Sortino Ratio

Sortino ratio also measures how risk is compensated but it only considers downside risk. By considering that upside is benefit for investors, Sortino ratio is somehow a more accurate measure. In the graph below, we can still get the conclusion that Strategy 01_04, 03_01 and 01_12 have almost the same median Sortino ratio. Similarly, Strategy 03_01 is still the best strategy among the three because the stats is more stable here. Strategy 03_07 and 01_10 is are worse due due to low average Sortino ratio and higher standard deviation.



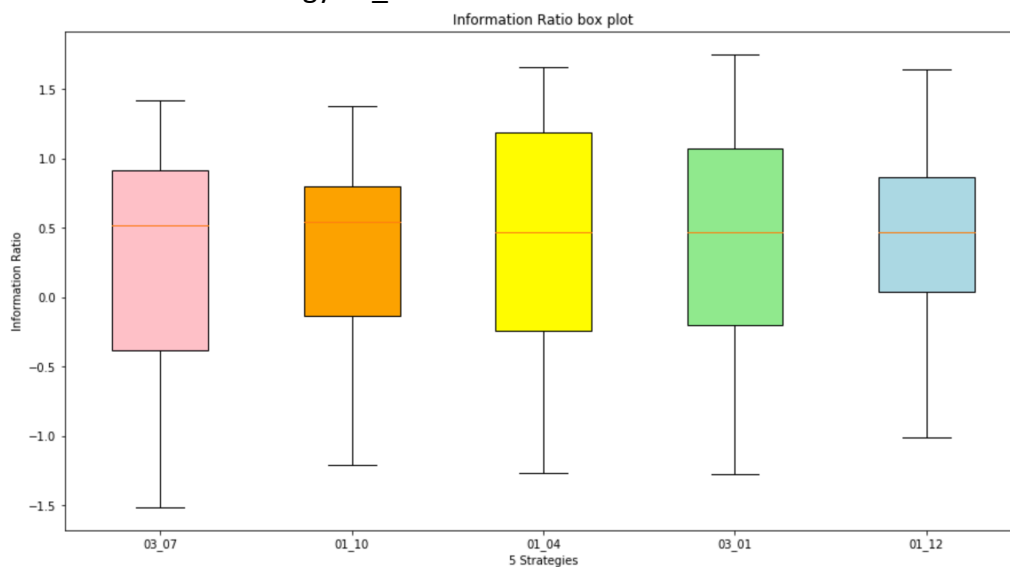
3.5 Calmar Ratio

Calmar ratio measures how investors are compensated by risk and risk here is measured by max drawdown rate. Here, we can still find that Strategy 03_01 is the best one with the highest median Calmar ratio and lowest standard deviation. Strategy 03_07 should be the worst. Other rankings are also exactly the same as previous analysis.



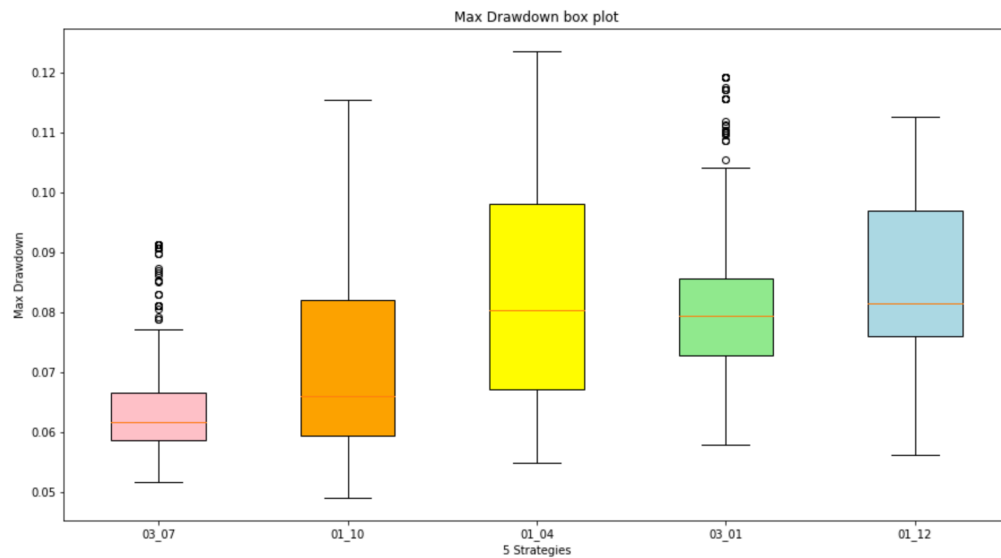
3.6 Information Ratio

Information ratio measures how well the strategy outperform the benchmark. Specifically, how much return you can get by taking more risk (compared with benchmark). According to the graph below, it's also difficult for us to tell which one is good or not. All of the 5 strategy has almost the same median and mean. Strategy 01_12 has the smallest standard deviation.



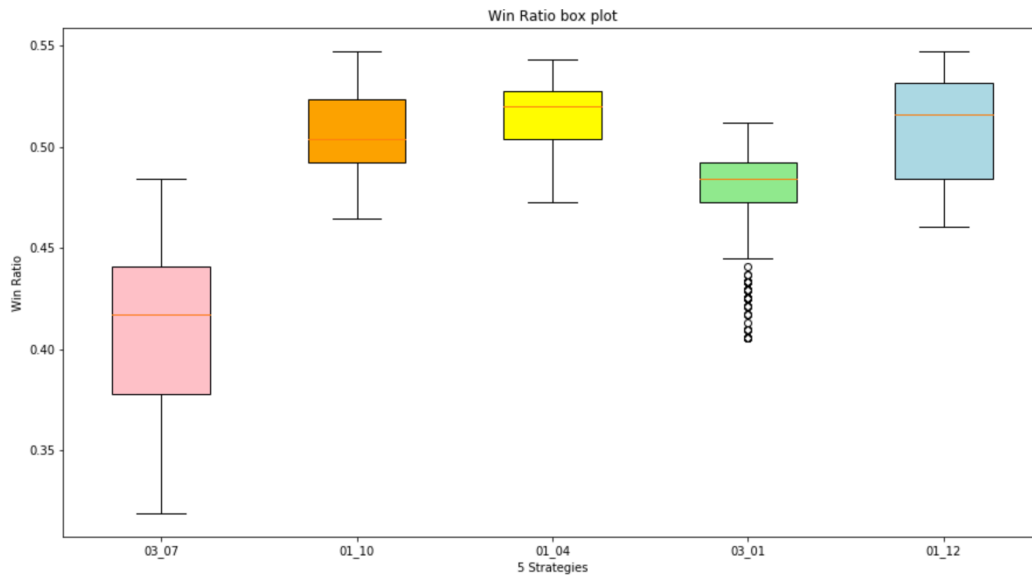
3.7 Max Drawdown

Max drawdown is one of the most important measure to state whether a strategy is stable. In the graph below, we can find that the median max drawdown of strategy 01_04, 03_01 and 01_12 is almost the same and higher than strategy 03_07 and 01_10. It's difficult to tell who is better between strategy 03_01 and 01_12. It seems that strategy 01_12 is more risky, but meanwhile, strategy 03_01 has so many outliers. The absolute value of max drawdown is also not a depending indicator for it only take stability into consideration.



3.8 Win Ratio

Win ratio measures your accuracy of bets. Higher win ratio means your strategy has a higher chance to earn money rather than lose money. But it only considers the direction but neglect the magnitude which is also important. From the graph we can find that strategy 01_12, 01_04 has a higher win ratio and strategy 03_01 is worse. But we cannot tell that strategy 03_01 is a bad strategy.



4. Conclusion

According to the analysis above we can rank the five strategies as $03_01 > 01_12 > 01_04 > 01_10 > 03_07$. We can see that it's a little different from what we get directly from the stats on the how dataset. By applying sliding window processes, we can find that strategy 03_01 has a more stable stats when we slide the window day by day. Although in the whole dataset, strategy 01_12 outperforms strategy 03_01, it's only a coincidence of a specific dataset. Hence, both stats and stability of stats are essential when we evaluate a strategy.