Strategy Performance Analysis Report

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1 Overall View

First of all, the Dataframe tells us that it is the daily return of 24 different strategies over the same underlying asset, a foreign exchange derivative which is labeled as "XAU/USD". The data expand from 2014-01-01 to 2016-12-30, and the whole period is in length of 783 trading days. Now since we have 24 strategies and their daily return, we can do some basic exploration on their performance.

1.1 Return, Vol, IR

Firstly, we consider such simple and basic statistics: cumulative return, annualized return, annualized volatility and information ratio (here is annualized return over annualized volatility), as shown in figure 1.

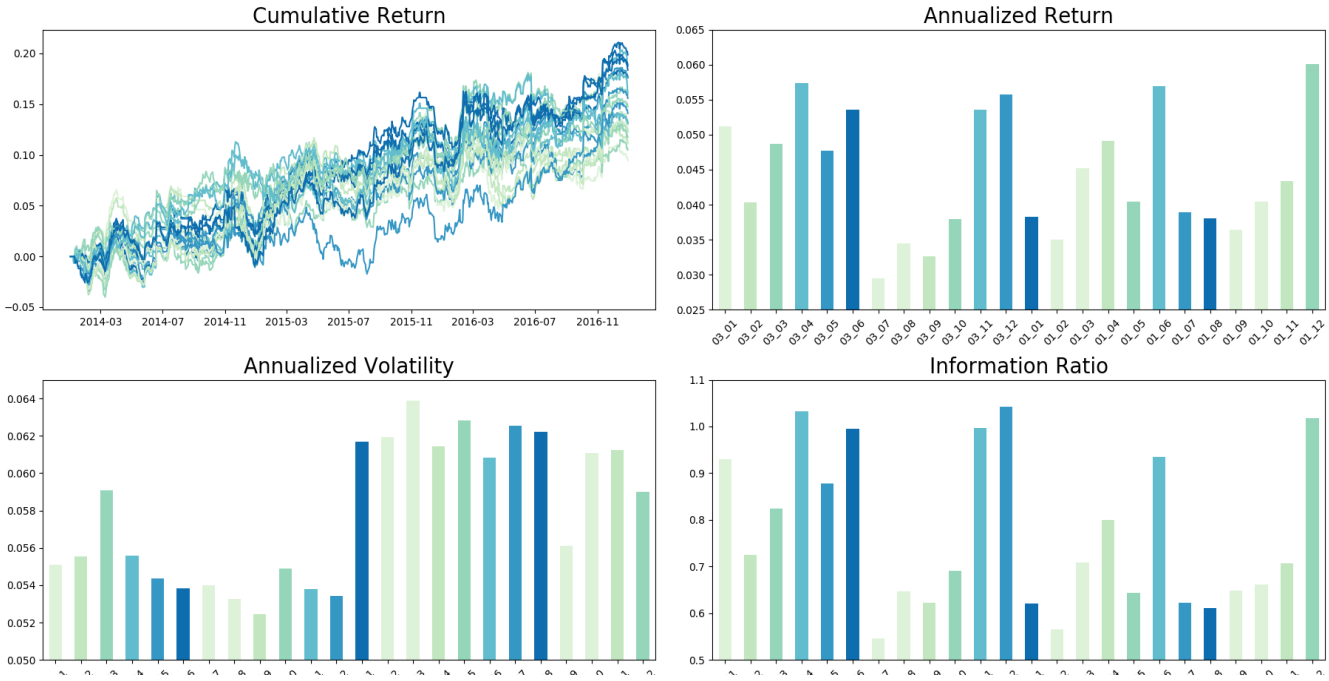


Figure 1: Return, Vol and Info Ratio

As we may see the range between the annualized return and annualized volatility are in the same level, we can also see that all the Information Ratios are not very high, but get a huge range, from lowest 0.52 up to highest 1.05.

1.2 Drawdown

Another crucial measurement of the strategy performance is Drawdown. While volatility measures both the upside and downside risks, people care more about the downside risks, they accept the fluctuation when making money. So we use drawdown to measure the downside risk of strategies.

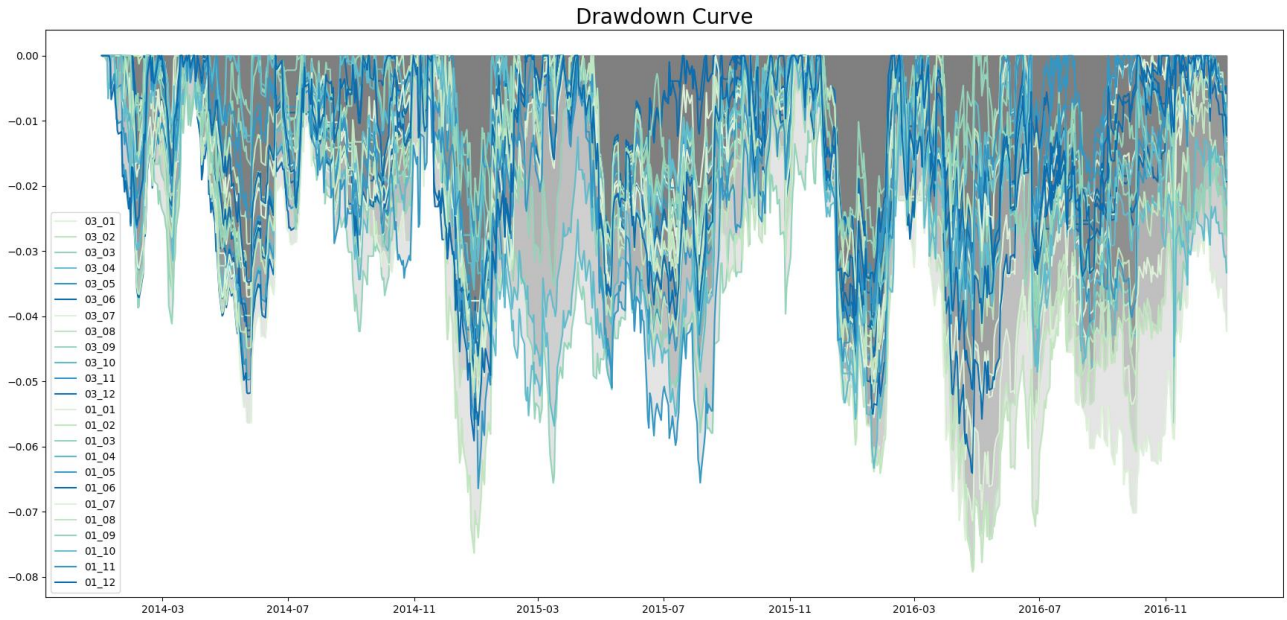


Figure 2: Drawdown Curve

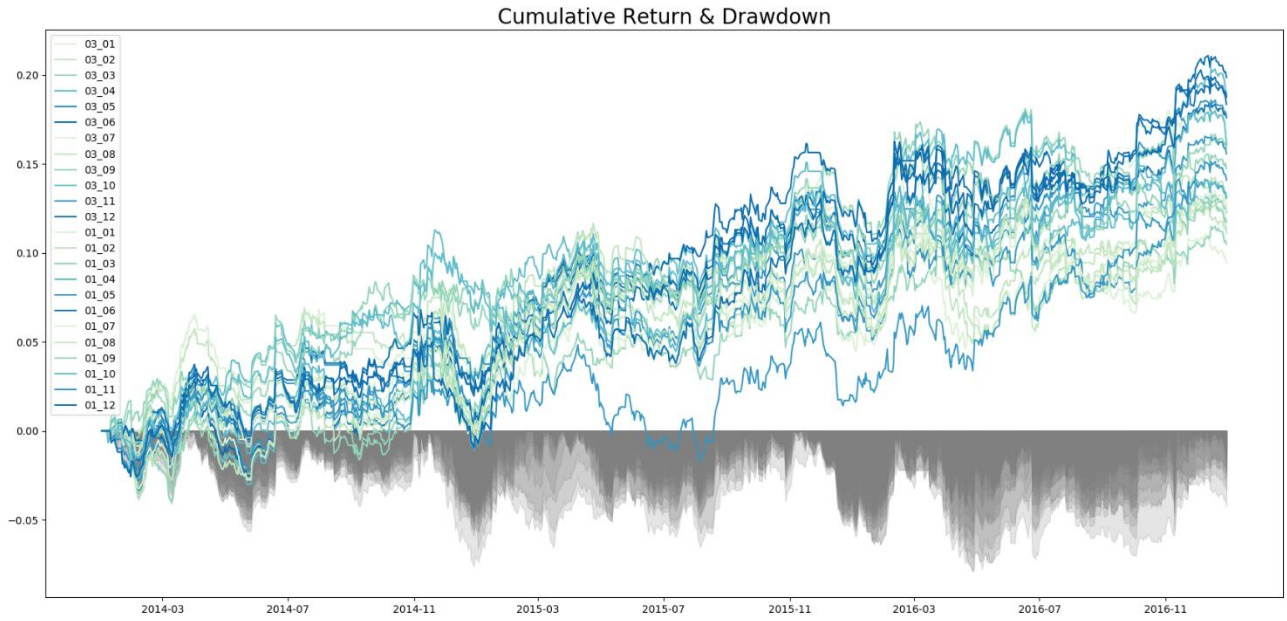


Figure 3: Drawdown curve with Cumulative return

From Figure2 and 3 we can see that, the drawdown area is filled with grey color,

if the grey is super dark, then it means during that period of time, most of the 24 strategies perform badly. For instance, 2015-12 to 2016-02. We may also check it in the cumulative return curve above to see this systematic decline during that exact period.

2 Within 5 chosen strategies

Obliviously, using only one of Cumulative Return or Annualized Volatility to rank the performance of 24 strategies could be biased, so I rank the strategies with Information Ratio, extract the top and bottom, then chose the left three based on equal interval quantile. The strategies I chose here are: 03_07, 01_05, 01_03, 01_06, 03_12. (With the IR from lowest to highest).

2.1 Return, Vol, Maximum Drawdown (MDD), IR, Return/MDD

Again, we consider those statistics, but this time, we take the Maximum drawdown into account. And since we all admit that Drawdown is a better measurement of the

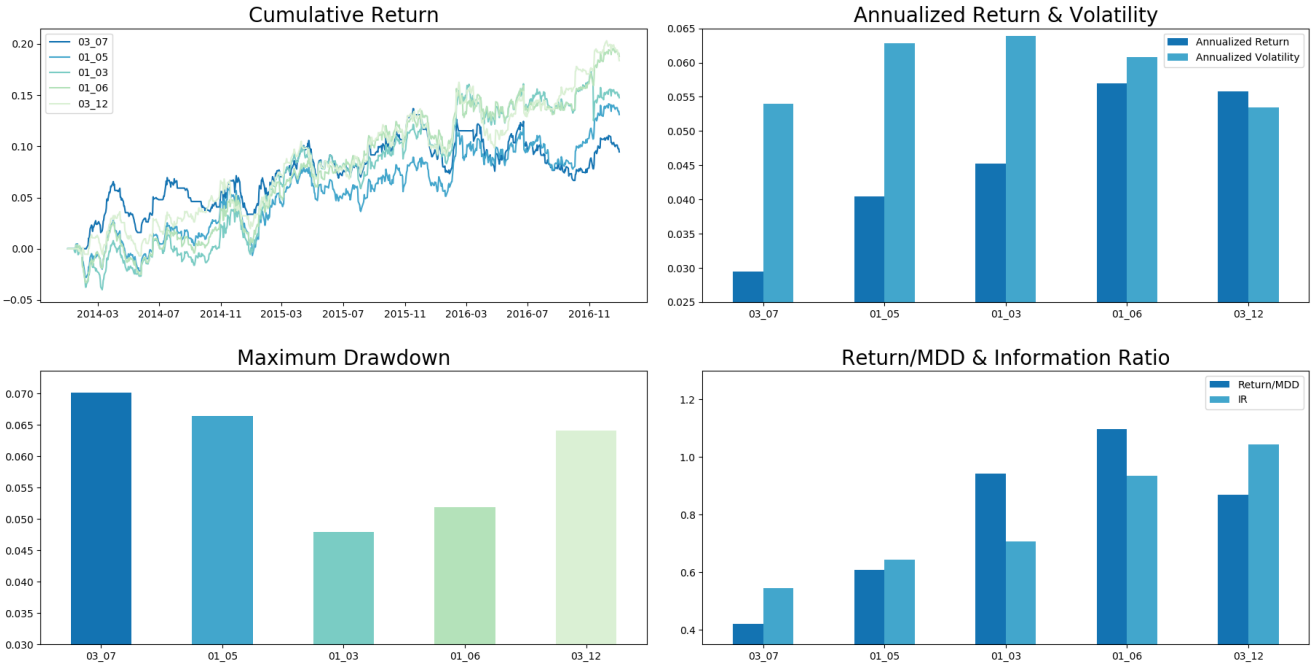


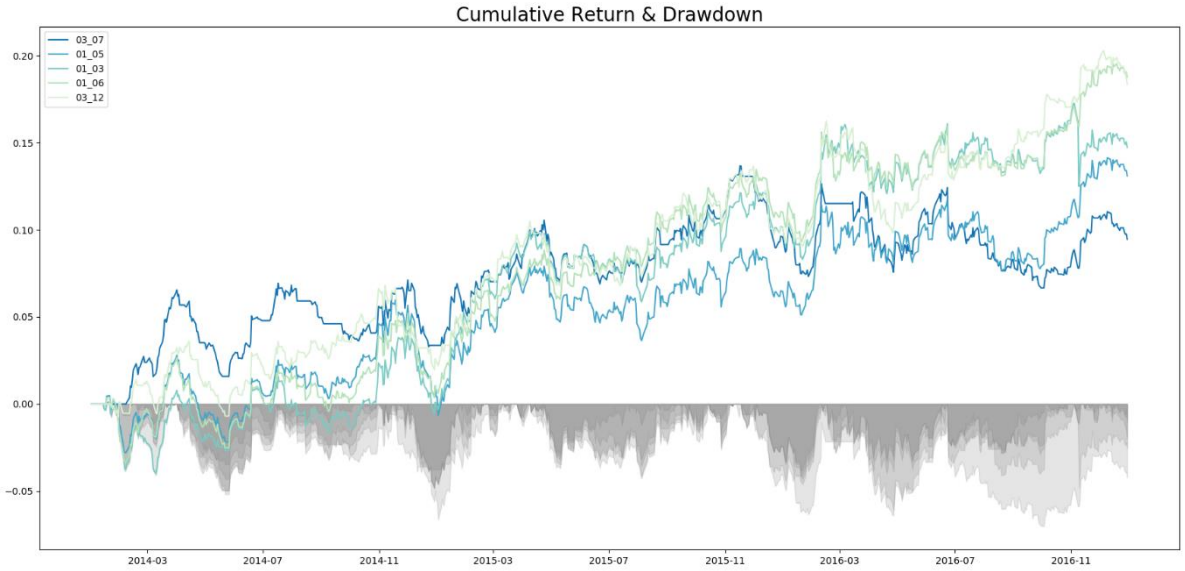
Figure 4: Ret, Vol, MDD, IR, Ret/MDD

downside risk that people dislike, we may consider the ratio of Return over MDD, as shown in Figure4.

Here we can check that, because of sorting by Info Ratio, the Annualized Return is following the ascending pattern, but not true for the volatility. And when we checking the Maximum Drawdown, and using the ratio of Return over MDD, we may se that the that last one (03_12) always make the pattern fail, due to the fact that although it is the strategy with the highest Information Ratio, its highest IR comes from the relatively lower volatility rather than a higher return, and its maximum drawdown is also in a higher level within the strategies we chose, which as a whole leads to the lower ratio of Return over Maximum Drawdown.

2.2Drawdown, Drough, Recover and Ratios

We again dig in further within the field of Drawdown. And first plot the Drawdown curve (Shown in Figure5) and then consider the largest 3 Drawdown and the Drough (Time to fall to the Mdd) and Recover (Time to recover from the Mdd), as shown below in Graph 1.



	MDD	drough1	recover1	2DD	drough2	recover2	3DD	drough3	recover3
03_07	-0.070136	228.0	66.0	-0.049675	34.0	41.0	-0.038389	16.0	40.0
01_05	-0.066402	33.0	48.0	-0.049727	38.0	103.0	-0.042825	81.0	50.0
01_03	-0.047978	20.0	20.0	-0.047802	3.0	38.0	-0.043078	35.0	14.0
01_06	-0.051840	38.0	114.0	-0.048379	20.0	29.0	-0.041403	34.0	14.0
03_12	-0.064066	51.0	114.0	-0.048501	36.0	36.0	-0.046165	38.0	14.0

Graph 1: Largest 3 Drawdown and dough, recover

As we can see a up to 7% drawdown with “03_07”, and the drawdown costs it 228 trading days to fall to it, meaning that the strategy is in trend of losing money for a long period of time and that drawdown recovery costs 66 trading days, which is a little more than 1/3 of the Drough.

In this sense, we may think of Recover to be as short as possible, but for Drough, I think it is better to look at the ratio of Drawdown over Drough, it can be seen as the

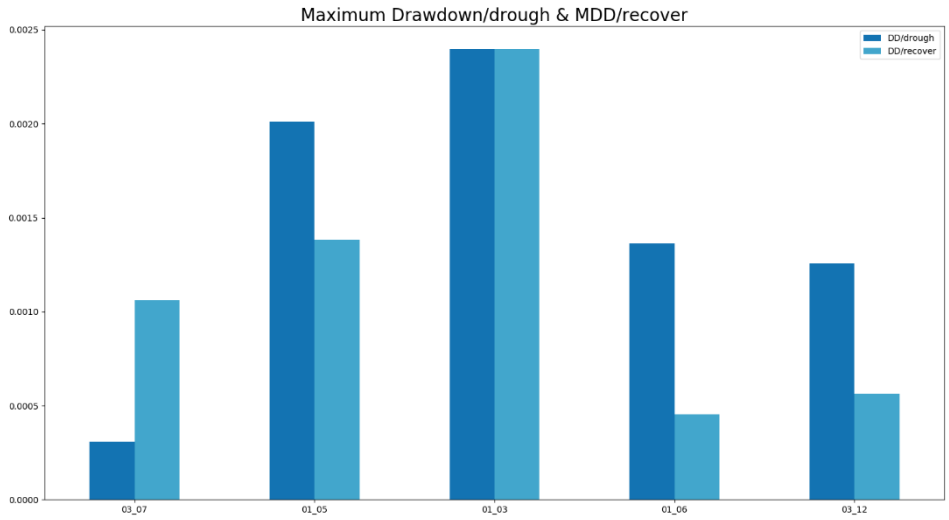


Figure 6: Maximum Drawdown/drough & Mdd over recover

“Drawdown speed” or “Drawdown return”, the concept can also be suitable for Recover. Here we just simply consider the Ratio for the maximum drawdown and its drough/recover. Which were shown in Figure 6.

Then we find that the sorted (by IR) strategies form a certain pattern here. The middle strategy has largest ratios in both, which means that it falls fastest to maximum drawdown and also recover the fastest. The strategy with highest IR (the last strategy above) tends to fall faster than recovery during the Maximum drawdown and the lowest IR one (the first one) enjoys a much faster recovery to its falling relatively.

3 Summary

The Dataframe shows us the daily return of 24 different strategies, upon which we have done some basic exploration on their performance, including cumulative return, annualized return, annualized volatility and drawdown curve. The Information Ratio for these strategies are not in high level and we see a systematic decline among most of

the strategies during 2015-12 to 2016-02.

We then sorted the strategies by Information Ratio and extract 5 stratified representatives, again measure their performances upon the aspects of return, vol and drawdown. This time we consider some more useful ratios like “Return/Max Drawdown”, which helps us to identify some potential problem about the strategy with the highest Information Ratio. We also consider the ratio of “Max Drawdown/drough & Max Drawdown/recover”, which measures the falling speed and recovery speed during the maximum drawdown. And it helps us to identify certain pattern among the ranking based on IR.