Designing And Implementing A Momentum Trading Strategy On Top 50 Nifty Stocks

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Trading Strategy Used

We will try using two different strategies and analyse both strategies.

Weak Strategy

We check the performance of every stock last year and invest on the top 5 performers till the end of current year. We will buy all of these five stocks in equal proportion and we won't be using any risk management techniques.

Strong Strategy

We check the past 365 days performance of every stock and buy the top 5 performers and hold it for a period of one month. We will buy all of these five stocks in equal proportion and we won't be using any risk management techniques.

Idea behind the strategies

Both strategies are based on the assumption that stocks that performed well over a period of one year will perform well in near future as well (Momentum Trading Strategy).

Idea behind Weak Strategy

We assume stocks that performed well last year will perform well this year. This strategy is relatively static. It does not adapt well to rapidly changing market conditions which makes it weak.

Idea behind Strong Strategy

We assume stocks that performed well over a span of one year before today will perform well for atleast a month. This strategy is relatively dynamic. It adapts relatively well to rapidly changing market conditions due to stronger constraints which makes it relatively strong.

Implementation details

GitHub repository with code and data visualizations can be found here.
Code for both strategies were written following the below structure :

- Data Collection.
- Developing our trading strategy.
- Backtesting our portfolio on historical data.
- Evaluation of metrics for comparison and analysis.

Some assumptions that were made for both strategies are as follows :

- Adjusted close was the only parameter that was used.
- Risk free rate was assumed to be 10%.
- Transaction costs, slippage etc. were ignored.
- Data since 2012 was used for backtesting.

Backtesting

As mentioned before, data since 2012 was used for backtesting. Metrics used for analysis and comparison of both startegies are as follows :

- Sharpe ratio.
- Cumulative Returns (in percentage).
- Excess returns (in percentage).
- Plots of cumulative returns over a period of 12 years.

Overview of results obtained after backtesting :

- Both strategies perform decently well on historical data.
- Both strategies yield good returns over a period of 12 years.
- Strong strategy yields much better results than Weak Strategy.
- Strong strategy consistently yields very good whereas Weak Strategy fluctuates a lot. This can be easily inferred from returns vs time plots.

Analysis

As expected, the Strong Strategy yields much higher returns as compared to Weak Strategy. Nevertheless, both strategies perform much better than Nifty index. It is easy to notice from the plots that returns in case of Strong Strategy increase exponentially whereas in case of Weak Strategy, the returns increase gradually over a period of 12 years. Strong Strategy has much higher Sharpe ratio and yields much better returns as compared to Weak Strategy.

Seemingly impossible Sharpe ratio in case of Strong Strategy

Sharpe ratio of Weak Strategy (roughly 1.15) seems to be practical whereas that of Strong Strategy (roughly 261.25) seems to be impractical. But if we compare the cumulative returns over a period of time for both strategies, it can be easily noticed that this is definitely possible because returns produced by the Strong Strategy on every single day is very high and hence, it's Sharpe ratio and cumulative returns also are expected to be high and hence it takes on seemingly impossible values.

Thank You

I would like to thank you for investing your valuable time on my presentation.