MC2 Project 2 Report

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1. Introduction

In this project we compare the performance of the Bollinger Band strategy with that of our own strategy.

2. Bollinger Band Strategy

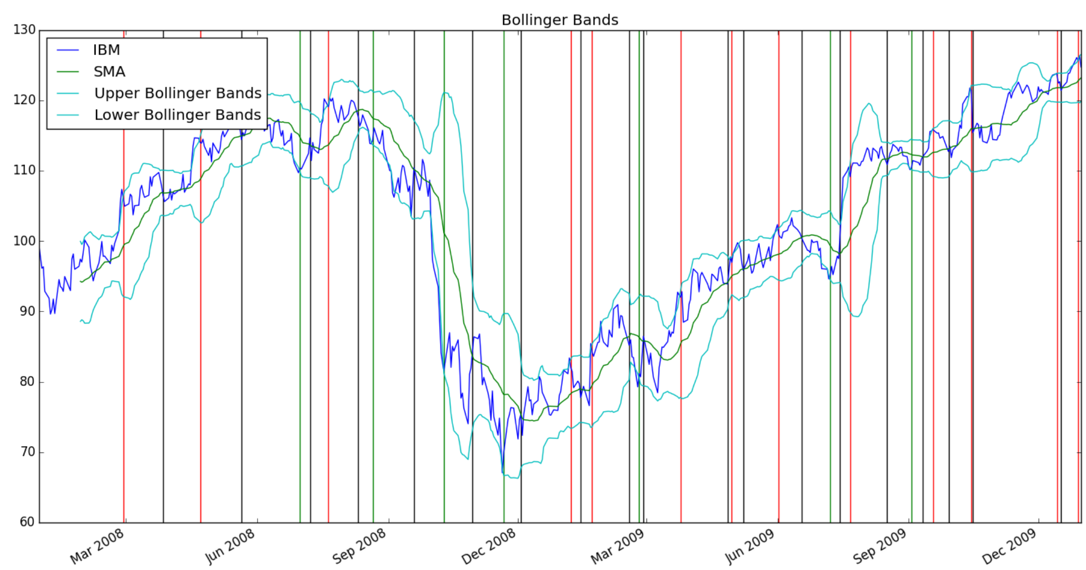

Fig. 1. Bollinger Band Strategy Chart

2.1. Bollinger Backtest Performance Metrics

`Data Range: 2007-12-31 to 2009-12-31`

`Sharpe Ratio of Fund: 0.97745615082`

`Sharpe Ratio of $SPX: -0.21996865409`

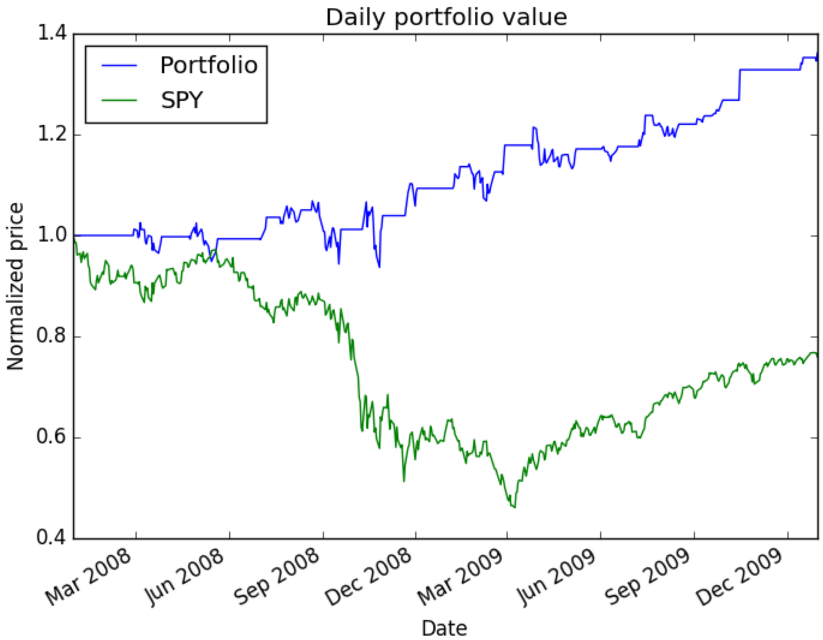

Fig. 2. Bollinger Band Strategy Backtest Chart

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Cumulative Return of Fund: 0.3614
Cumulative Return of $SPX: -0.240581328829

Standard Deviation of Fund: 0.0108802922269
Standard Deviation of $SPX: 0.0219524869863

Average Daily Return of Fund: 0.000669942567631
Average Daily Return of $SPX: -0.000304189525556

Final Portfolio Value: 13614.0
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3. New Strategy *myStrategy*

3.1. *Description of myStrategy*

The strategy uses a variation in positioning the upper and lower bands and also . The new bands at the defined positions are called *myStrategy* Bands. The upper and lower *myStrategy* Bands are defined at these positions :

$$\mathcal{M}_{upper} = sma(\mathcal{P}) + 2.1 * std(\mathcal{P}) \tag{1}$$

$$\mathcal{M}_{lower} = sma(\mathcal{P}) - 1.9 * std(\mathcal{P}) \tag{2}$$

The Long and Short entry/exit points are redefined in our strategy as a contrast to Bollinger Band strategy as described below :

1. **Long Entry :** Long entry condition occurs when the price moves from below the *myStrategy* Lower Band to above it just after a Long Entry condition i.e. $\mathcal{P} < \mathcal{M}_{lower}$ to $\mathcal{P} > \mathcal{M}_{lower}$.
2. **Long Exit :** Long exit condition occurs when the price moves from below the *myStrategy* Upper Band to above it i.e. $\mathcal{P} < \mathcal{M}_{upper}$ to $\mathcal{P} > \mathcal{M}_{upper}$.
3. **Short Entry :** Short Entry condition occurs when the price moves from above the *myStrategy* Upper Band to below it i.e. $\mathcal{P} > \mathcal{M}_{upper}$ to $\mathcal{P} < \mathcal{M}_{upper}$.
4. **Short Exit :** Short exit condition occurs when the price moves from above the $sma(\mathcal{P})$ to below it i.e. $\mathcal{P} > sma(\mathcal{P})$ to $\mathcal{P} < sma(\mathcal{P})$.

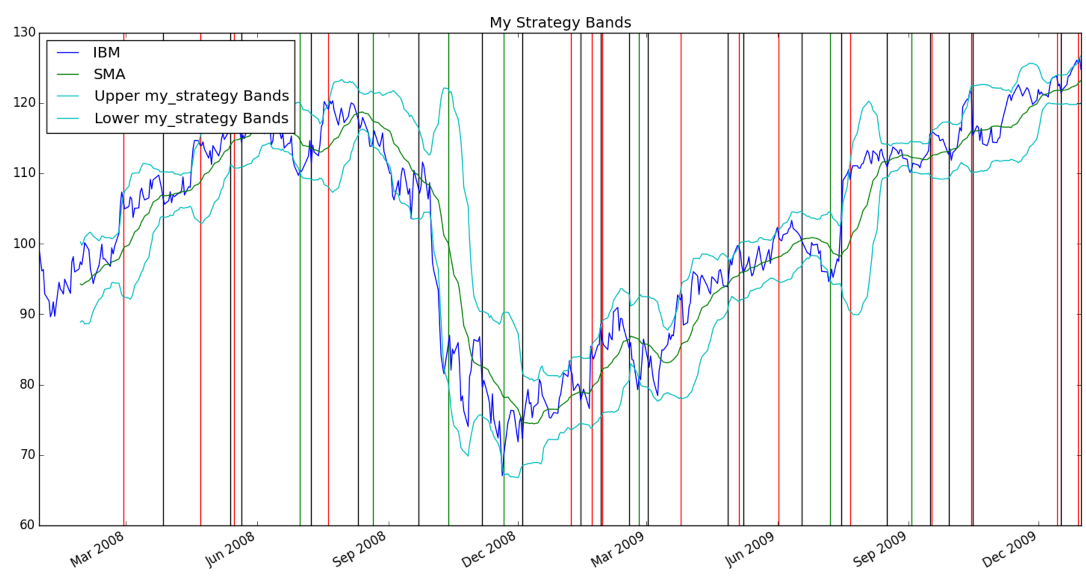

Fig. 3. My Strategy Chart

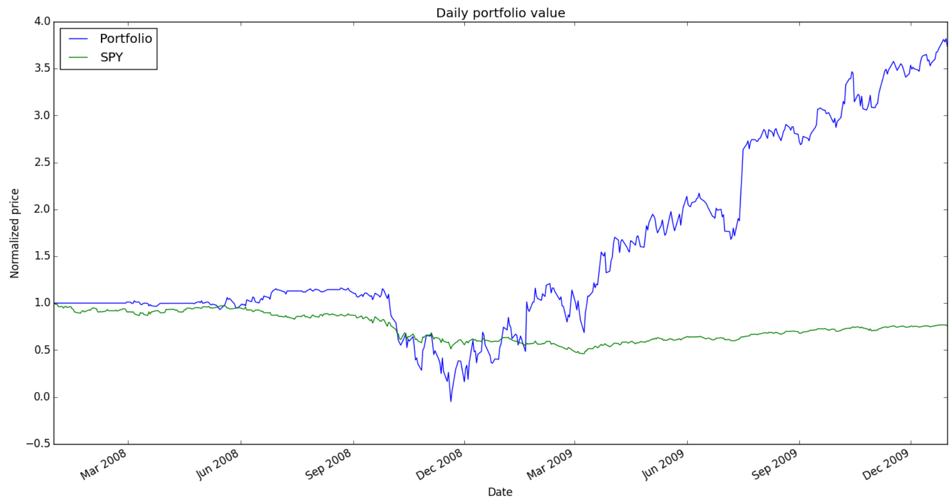

Fig. 4. My Strategy Backtest Chart

3.2. ***Idea behind myStrategy***

The idea is to defeat the Bollinger Band strategy. In this strategy we exit a Long condition not when we cross the $sma(\mathcal{P})$ but when we cross the upper myStrategy band. This rides on the idea that we hold a long position till it continues an upward trend of prices which ensures a higher profit rather than exiting it when we cross the $sma(\mathcal{P})$. Also since the Upper band is higher than traditional Bollinger Bands this ensures an exit at a very high price which again increases the profit.

Increasing the lower band as compared to traditional Bollinger lower Band ensures that we are more cautious in entering a Long position. This means that only when the stock has shown an upward trend for sometime we decide to buy it. This helps to ensure that we make a move when there is more chance of profit as seen from previous trades.

For the Short entry, since the upper band is higher than the traditional upper Bollinger Bands, this indicates that we Short the stock only when its price is starting to show a downward trend from a high value. This means it will lead to some over valuing of the stock price and hence it will eventually lead to lowering of the price which again will provide better profit and opportunity for Long.

3.3. ***myStrategy backtest performance metrics***

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Data Range: 2007-12-31 to 2009-12-31

Sharpe Ratio of Fund: 0.466216070238
Sharpe Ratio of $SPX: -0.21996865409

Cumulative Return of Fund: 2.739
Cumulative Return of $SPX: -0.240581328829
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Standard Deviation of Fund: 0.234384582463
Standard Deviation of $SPX: 0.0219524869863

Average Daily Return of Fund: 0.00688360608593
Average Daily Return of $SPX: -0.000304189525556

Final Portfolio Value: 37390.0
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3.4. *myStrategy performance comparison with Bollinger Band strategy*

Cumulative Return of fund using myStrategy is 2.739 whereas that of Bollinger Band strategy is 0.3614. We observe a very high increase of Cumulative return using our strategy. The Final portfolio value using myStrategy is 37390.0 as compared to 13614.0 with that of Bollinger Band. Hence we can show that myStrategy is performing better than Bollinger Band with respect to Cumulative Return.