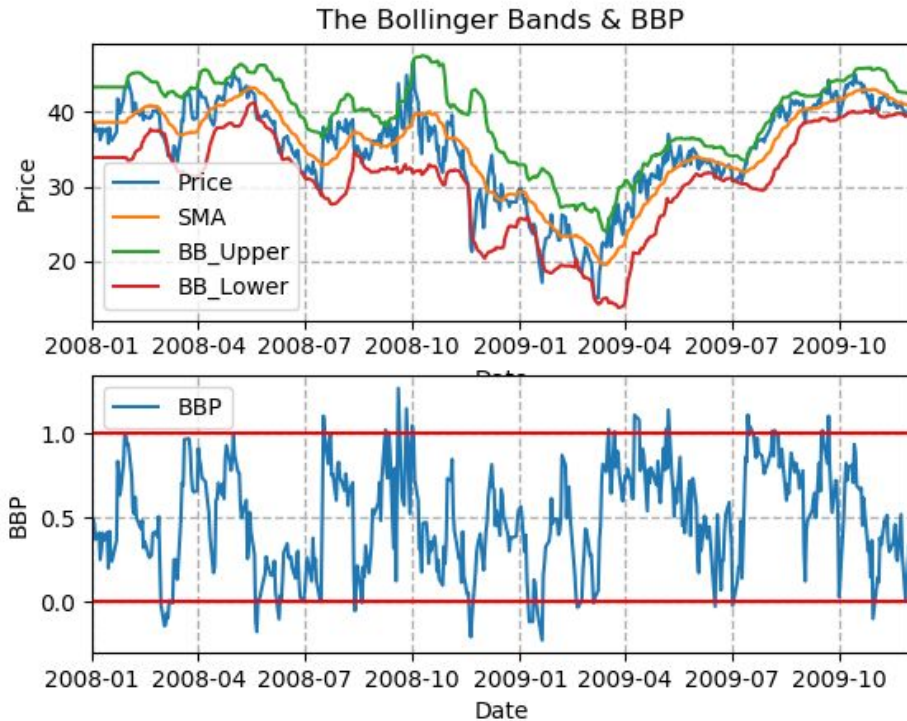# Project 6 Indicator Evaluation (Spring 2020)

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**1 TECHNICAL INDICATORS**

1.1 Bollinger Bands & Bollinger Bands Percent

Bollinger Bands are a <u>volatility indicator</u> which creates a band of three lines which are plotted in relation to a security's price.
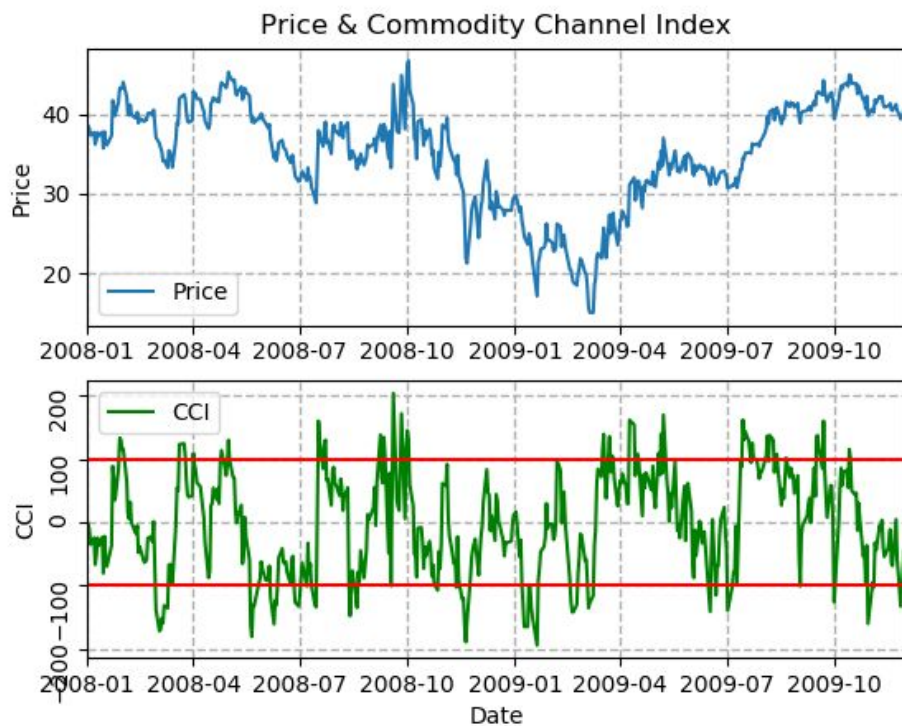
1)Pull a set of stock prices for the indicator(in this case, we use JPM)

2)Find a 20 day simple moving average (SMA) for the stock.

3)Fill backward for Nan values.

4)Find the Upper/Lower Bounds by 20-day SMA +/- 2x(20-day standard deviation of price)

5)Fill backward for the None(nan) values.

6)Plot the first chart for stock price with bollinger bands where X-axis is for Date and Y-axis is for the stock price.

6)Calculate the Bollinger Bands Percent(BBP) as follows

%B = (Current Price - Lower Band) / (Upper Band - Lower Band)

7) Load the BBP data to the chart.

1.2 Price/Simple Moving Average(SMA)
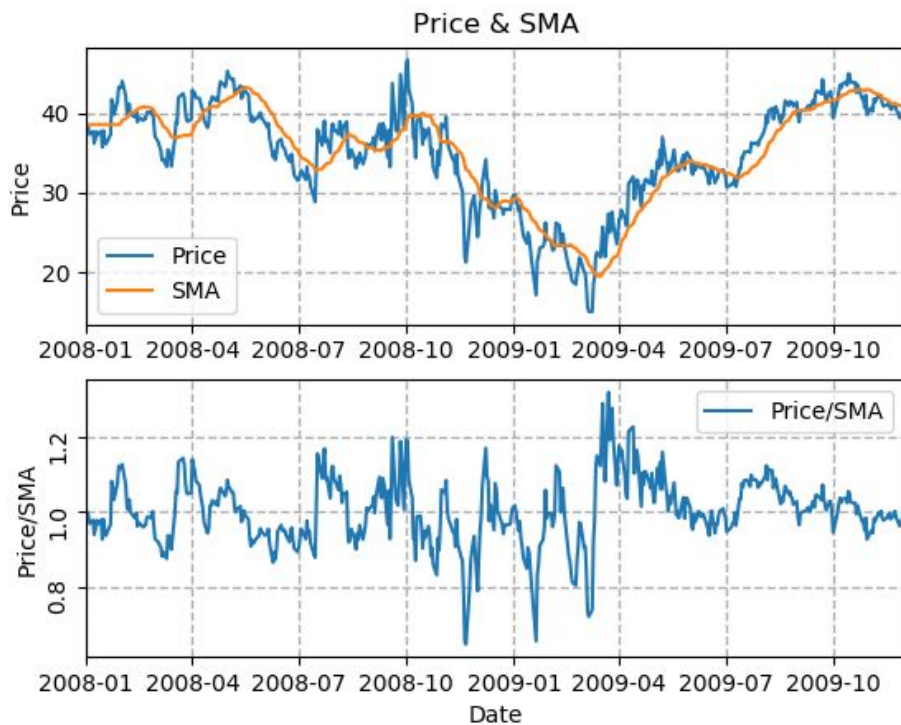
1)Pull a set of stock prices for SMA indicator(in this case, we use JPM)

2)Find a 20 day simple moving average (SMA) for the stock.

3)Fill backward for Nan values.

4)Plot the Price and SMA in the first chart.

5)Calculate the Indicator Price/SMA.

6)Load the indicator data to the 2nd chart.

1.3 Commodity Channel Index(CCI)

The indicator is used to identify <u>overbought and oversold levels</u> by measuring an instrument's variations away from its statistical mean.

1)Pull a set of stock prices for SMA indicator(in this case, we use JPM)
2)Find a 20 day simple moving average (SMA) for the stock.
3)Find a 20 day simple moving standard deviation(STD) for the stock.
4)Fill backward for Nan values.
5)Calculate the Indicator Commodity Channel Index(CCI) as follows
$$CCI = (Typical\ Price - SMA) / (0.015 * STD)$$
6)Load the stock price data to the first chart and indicator data to the 2nd chart.

1.4 Rate of Change(ROC)


Price & Rate of Change
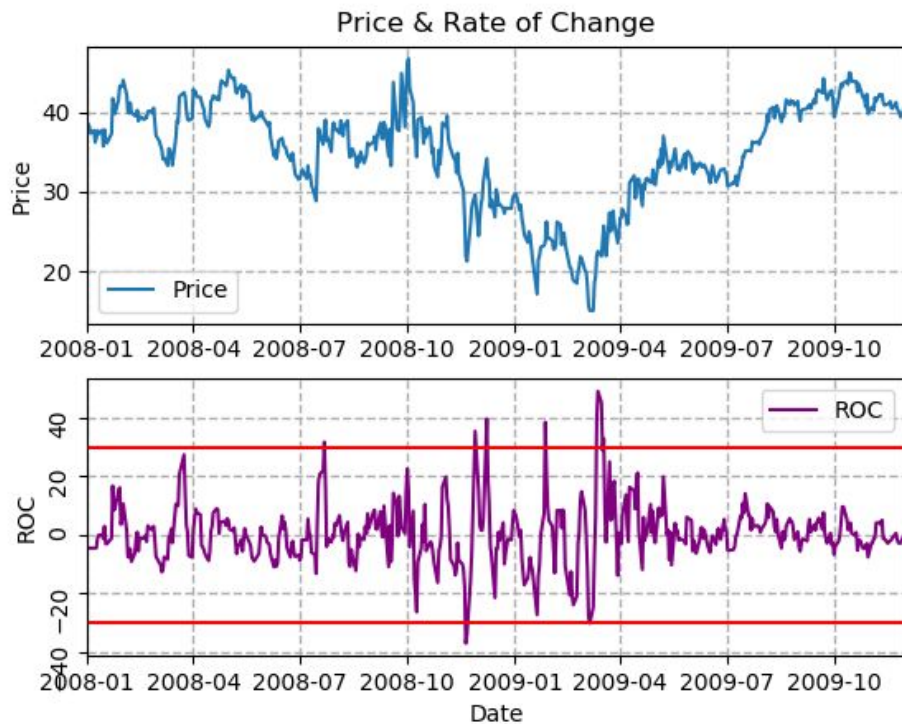
This indicator calculates the percent change in price between periods and is used for trend identification, and identifying overbought and oversold conditions. Identifying overbought and oversold conditions can be a little less clear because this indicator is not range bound. One of good ways to find out the thread of overbought and oversold, is by using research and historical analysis.

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1)Pull a set of stock prices for SMA indicator(in this case, we use JPM)

2)Find a price difference for the day with the stock price after 5 days.

3)Calculate the Indicator Rate of Change(ROC) as follows

$$ROC = (price[t] - price[t-n]) / price[t-n] * 100$$

6)Load the stock price data to the first chart and indicator data to the 2nd chart.

1.5 Detrended Price Oscillator (DPO)
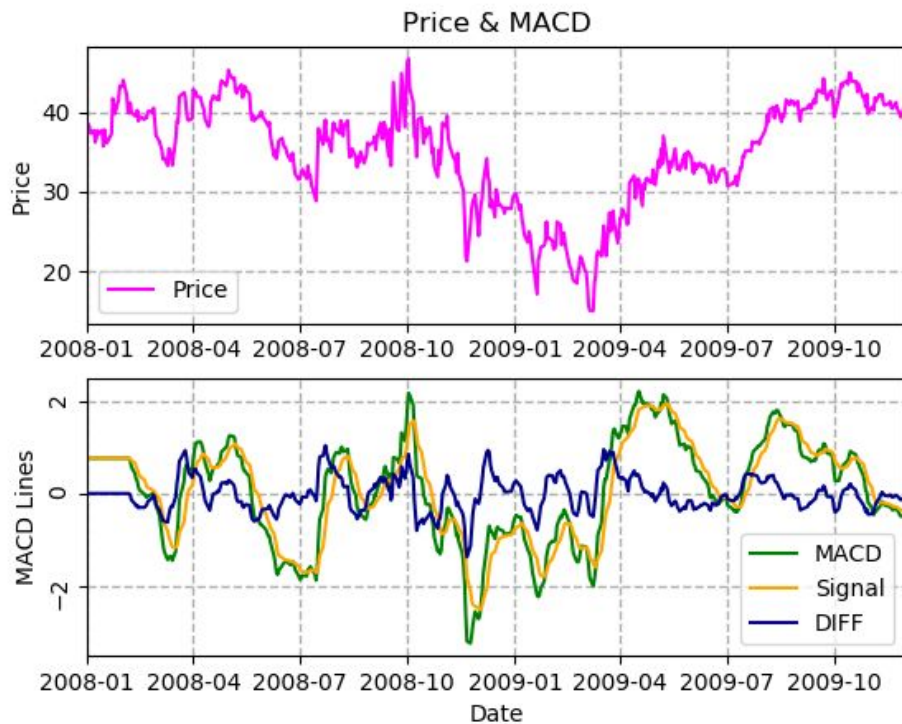
MACD can be used to identify aspects of a security's overall trend. Most notably these aspects are momentum, as well as trend direction and duration.

1)Pull a set of stock prices for SMA indicator(in this case, we use JPM)
2)Find Exponential Moving Average(EMA) of the stock price for 12 days and 26 days respectively.
3)Find a MACD Line as follows

MACD = EMA(12 days) - EMA(26 days)

4)Find Signal Line by

Signal Line= EMA(9 days of MACD)

5)Calculate the difference of MACD - Signal.
6)Plot the stock price data on the first chart and the others on the second chart for the analysis.

REFERENCES

1. Mitchell, T. M. (2017). Machine learning. New York: McGraw Hill.
2. Retrieved from https://www.tradingview.com/wiki/