FE517_SAS for Finance
Stock Price Prediction with SMA Trading Strategy

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Introduction:

- Our project is to do backtesting, which seeks to estimate the performance of a strategy or model if it had been employed during a past period.
- In the beginning, we downloaded three representative stocks of different industries and one index from 1/1/2010 to 11/30/2018 via Yahoo Finance and they were Apple Inc. (APPL), General Electric Company (GE), Morgan Stanley (MS) and S&P 500 (^GSPC).
- Our target was to compare the profit of simply holding the stock with using SMA strategy.

Methodology approach

- Simple moving average crossing (SMA):
  A simple moving average (SMA) is an arithmetic moving average calculated by adding the closing price of the security for a number of time periods and then dividing this total by the number of time periods. Most traders watch for short-term averages to cross above longer-term averages to signal the beginning of an uptrend. Short-term averages can act as levels of support when the price experiences a pullback.

Implementation approach:

1. First of all, we imported all csv files into SAS files and then calculated their basic statistical analyses and plotted time series for each index.
2. Next, we created two moving average curves which are "Normal Closing Price", "SMA_Short" and "SMA_Long" selecting "Date" and "Close" these two variables (we select 50 days for the short one and 200 days for the long one).
3. Furthermore, we pointed out the interactions of "SMA_Short" curve and SMA_Long" curve and labeled them as "buy" and "sell" signals for traders.
4. Finally, we compared the results between using SMA and just holding the stock.

Conclusions:
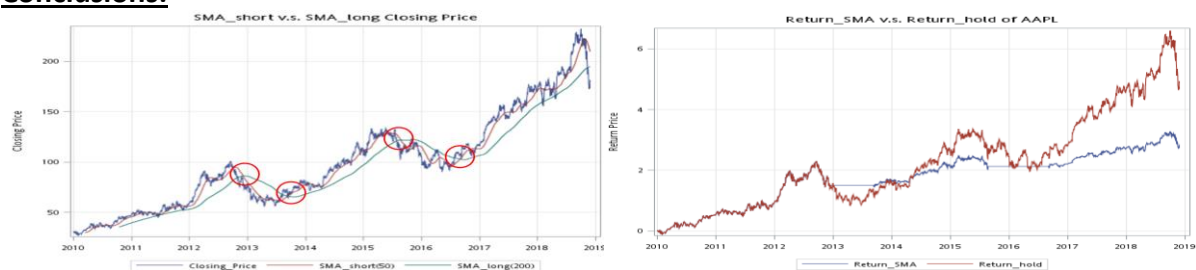
At most of the times, using SMA strategy can only earn very little profit, which is much less than just holding the stocks (for some stocks SMA will even loss money), that's because we select too many days when generating moving average curves, in this way this strategy becomes less sensitive, for the stocks which are increasing fast like AAPL, SMA will miss the best opportunity to get in the market; for the stocks have great volatility on their prices, SMA would not act in time before the market trend changes. So there remains a lot of work to improve SMA.