SFM-01 Summary Document

Overview

- Excel is a quick and cheap way to do hypothesis testing of a trading idea. For detailed backtesting, we recommend using a programming language like Python or feature-rich tools.
- This lecture primarily focuses on hypothesis testing or backtesting of trading ideas using spreadsheet software like Microsoft Excel. It has used some of the simple yet powerful and popular indicators in the examples to demonstrate the same.

Moving Average

- **Moving Average (Simple Moving Average):** Moving Average is a rolling average of a price series in a specific frequency, for example, please refer below to the daily price series of RELIANCE stock.

Date	Price
2021-05-03	1959
2021-05-04	1917
2021-05-05	1920
2021-05-07	1932
2021-05-11	1933
2021-05-12	1913
2021-05-14	1937
2021-05-17	1960
2021-05-18	1988
2021-05-19	1997
2021-05-25	1963
2021-05-26	1970
2021-05-28	2095

The moving average of the last 5 periods on 2021-05-12 is calculated as the average of prices from 2021-05-03 to 2021-05-11.

Date	Price	Moving Average(5)
2021-05-03	1959	
2021-05-04	1917	
2021-05-05	1920	
2021-05-07	1932	
2021-05-11	1933	1932 ×
2021-05-12	191 ?	=average(C3:C7
2021-05-14	1937	
2021-05-17	1960	
2021-05-18	1988	
2021-05-19	1997	
2021-05-25	1963	
2021-05-26	1970	
2021-05-28	2095	

The moving average of the last 5 periods on 2021-05-17 is calculated as the average of prices from 2021-05-05 to 2021-05-14.

Date	Price	Moving Average(5)
2021-05-03	1959	
2021-05-04	1917	
2021-05-05	1920	
2021-05-07	1932	
2021-05-11	1933	
2021-05-12	1913	1932
2021-05-14	1937	1927 ×
2021-05-17	196 ?	=average(C5:C9
2021-05-18	1988	
2021-05-19	1997	
2021-05-25	1963	
2021-05-26	1970	
2021-05-28	2095	

Moving Average Crossover

- Crossovers are a common way traders use moving averages. A crossover occurs when a short moving average crosses either above the long moving average or below the long moving average.
- When the short moving average is above the long moving average, a stock is considered to be bullish.
- When the short moving average is below the long moving average, a stock is considered to be bearish.
- Moving average crossovers help you to determine when a trend is about to end and reverse. It is used to capture the momentum of the instrument.
- Let us consider a trading idea described in the lecture:
    - Trading Idea:
        - Use moving averages as an indicator for this strategy.
            - Short moving average = 30 DMA (Daily Moving Average)
            - Long moving average = 100 DMA (Daily Moving Average)
        - If 30 DMA > 100 DMA then take a long position and square off the position when 30 DMA <= 100 DMA
        - If 30 DMA < 100 DMA then take a short position and square off the position when 30 DMA >= 100 DMA
    - Steps:
        - Download the OHLC (Open, High, Low, Close) data from Yahoo finance in the excel file.
        - Calculate the 30 days moving average and 100 days moving average using the steps mentioned in the previous section.
        - Create trading signals in the next column by comparing the values of 30 DMA and 100 DMA.
            - =If (“30DMA”>”100DMA”, ”BUY”, ”SELL”)
    - Excel steps:
        - Calculate SMA (30 DMA) in column H
        - Calculate LMA (100 DMA) in column I
        - Calculate trading signal as buy/sell in column J
        - Calculate trading price in column K as per the signal in column J
        - Calculate strategy returns in column L

VWAP

- Volume Weighted Average Price (VWAP) is an indicator calculated using volume and price.
- Generally, Typical price is used to calculate VWAP.
- VWAP = sum(Volume*Price)/sum(Volume)
- Excel steps:

- Calculate typical price in column H. The typical price is the average of high, low, and close prices.
- Calculate TPVolume (Total Price Volume) in column I by multiplying the typical price with the volume of the security.
- Calculate Cumulative TPVolume in column J by adding the current TPVolume to the previous one.
- Calculate Cumulative Volume in column K by adding the current volume to the previous one.
- Finally, calculate VWAP in column L by dividing the cumulative TPVolume by cumulative volume.
- Calculate trading signal as buy/sell in column M.
- Calculate trading price in column N as per the signal in column M.
- Calculate returns in column O.

RSI

- RSI is one of the most popular indicators used to measure the momentum of the stock market.
- The Relative Strength Index helps you decide if a stock is overbought or oversold.
- It's a momentum-based oscillator and is a widely used technical analysis tool.
- RSI compares recent upwards movements to recent downwards movements in the closing price of a stock.

RSI Calculation

- RSI is defined as follows:
  - RSI = 100–100/(1+ RS)
  - RS is the Relative Strength, which is the ratio of average gains and losses in the given period.

RSI Interpretation:

- RSI varies between 0 and 100.
- A stock is generally considered overbought if RSI moves above 70, or oversold if its RSI moves below 30.
- If the stock price reaches new highs, but the RSI does not rise above its previous high, then the stock price is due to fall.
- When the RSI moves above 50, the average gains outweigh the average losses; this is considered bullish.
- When the RSI falls below 50, the average losses outweigh the average gains; this is considered bearish.