Problem statement: Rule based portfolio formation and Analysis

Input File: Price Data, volume Data and Market Cap Data

Portfolio Rule:

Data on stock Price, Volume and Market Capitalisation is given for 1228 Stocks for last working day of month for last 20 years. Price is average price on the day; volume is number of shares traded.

For each month end date, create a portfolio of stocks by following rules:

- Select most liquid 250 names based on past 6 months. (Liquidity is given by price multiplied volume)
- From 250 names select the stocks which have seen minimum of maximum 1-year drawdown. Drawdown is defined as peak-to-trough decline during a specific period (here last 1-year). So for each stock there will be maximum and minimum price point in last 1 year. The ratio of minimum price to maximum price will give maximum drawdown for that stocks. From the universe of 250 stocks selected on liquidity, select top 100 which have seen minimum of maximum drawdown.
- From the selected 100 names, select 20 stocks with maximum return in last 1 month to get the required portfolio, which changes every month
- Create NAV series from the selected portfolio assuming equal amount in each stocks. So at 1st portfolio assume 100 crores distributed in 20 stocks: - 5 crores in each. Based on returns of stocks in portfolio, 100 crores will maybe grow into 110 crores next month (or declined to 98 crores maybe). In the next month redistribute the 110 crores (or 98 crores depending on returns) equally into 2nd portfolio and then it grows into maybe 121 crores, redistribute that equally into 3rd portfolio and so on. The series of 100, 110, 121 etc. is the net asset value or NAV series.
- From Market Cap file we have market capitalisation on each date as well. For each date sort stocks on highest to lowest market cap. Large Cap stocks are stocks which are in largest 100 stocks by market cap, Mid Cap are those which are in 100-250 and Small Cap are those having market capitalisation below market cap of top 250 stocks. Let's say out of 20 stocks in selected portfolio 8 names are in top 100, 7 in 100 to 250 and 5 below 250. So 40% of portfolio is in Large cap, 35% in Mid cap and 25% in Small Cap.

Expectations from candidate –

- List of stocks in portfolio on each month end. (in excel)
- NAV series (Net Asset Value on each month end). (in excel)
- % of portfolio in Large Cap, Mid Cap and Small cap stock on each month end. (in excel)
- Source code. (Python script used to do the above analysis)