Methodology

1. Dataset

The dataset used in this research consists of the closing prices of 3 stock indices of India namely SENSEX, NIFTY50 and NIFTY Consumption every day from 01-01-2014 to 31-12-2023 (10 years). SENSEX is a free-float market capitalization consisting of 30 most traded and relatively liquid stocks which contribute towards the balance of the country’s equity market. NIFTY50 on the other hand is a benchmark index of 50 companies. NIFTY Consumption reflects the performance of companies in the domestic consumption sector. The data for SENSEX and NIFTY50 is taken from MarketWatch and NIFTY Consumption is taken from Yahoo Finance.

1. Creation of graph

The graph is constructed using the study of Cao, Lin et. al. who uses N-day volatility V, and N-day return R in order to divide the movement of stock index in 4 separate variations.

Here, *t* refers to the current day in consideration and N refers to the number of continuous trading days (generally a week if there is no national holiday) and Close(t) refers to the closing price of the stock index on *tth* day. In order to find out V, we need to find one-day return which is r which is given by

After calculating r, we can calculate V for N days is given by

Where refers to the standard deviation of

We can now calculate the average Volatility of entire stock index in question by simply averaging over the entire time series.

Now, we can classify the changes in any stock index on the basis of these parameters in the following way –