**Proactive Analysis:**

Given the advent of derivatives simple analysis of stock price patterns is not sufficient. A combined analysis of following needs to be done. The list is given in the ascending order of sophistication of detection.

1. Stock price abnormalities along with changes in volumes of stock trading
2. Volatility changes, and pivots in smoothened volatility plots
3. put-call volumes changes in different strikes,
4. Associated implied volatility and pivots in the implied volatility

**Hindsight Analysis:** The analysis structure for detecting the insider trading should be as follows.

1. Scheduled news
   1. Speculation possible.
   2. In case of derivatives listed stocks, covered calls
2. Unscheduled news
   1. Pre and post news analysis a time frame needs to be chosen to carry out the analysis. The steps listed for proactive analysis can be carried out here

**Model:** Logistic regression for detecting insider trading. This model needs to be run on each of the days (may be a month or so, depending upon the news classification) ,prior and post the news.

Dependent variable: Y; probability of insider trading

Explanatory variables:

1. % change in smoothened volatility of the stock.-% change in smoothened volatility of market.
2. Time difference between the date of calculation and news release time (in days)
3. Scheduled/Unscheduled new information (1/0)
4. % volume change
5. Stock classification (A, B, C, D,Z)

In case a company is listed on derivatives exchange, then the following additional variables come into play.

1. % change in the implied volatility of the out of the money call options ( Simple model building on the assumption that insiders wish to cash in on the information quickly , without much expense )
2. % change in volume of the associated out of money options.

This will add an additional 10 variables, since there will be 5 additional call/puts being traded at any point.