

The very first thing is to estimate a characteristic line for a particular stock. Characteristic Line done by sampling in a period other than the one surrounding the event

Characteristic line gives us an expectation of what the stock's return should be a particular day, given that the market has produced a particular rate of return.

$$E(r_j|r_{M,t}) = \hat{\alpha}_j + \hat{\beta}_j r_{M,t}$$

To measure the stock's overall reaction to the event, we might accumulate the responses going from day -10 to day +10

$$\sum_{t=-10}^{+10} \varepsilon_{j,t} = E_{j,+10}$$

Individual stocks are subject to the flow of a variety of types of information. Thus, the response to the particular event of interest may be masked by the response to the other pieces of information. We collect a large sample of stocks that have in common the incidence of a particular event (like the announcement of a takeover bid). The takeover bid may come at different calendar times for the different stocks, but for each stock we compute the accumulated response relative to day 0, the day the takeover bid is announced.

The accumulated response is averaged over all M stocks in the sample, the cumulative average excess return:

$$E_t = \frac{\sum_{j=1}^M E_{j,t}}{M}$$

since the only thing the stocks in the sample have in common is the event, the other factors that are influencing their prices should cancel out in the averaging.

The Movement in  $\bar{E}_t$  as we approach the announcement of the event should give an indication of the average speed and accuracy of the response of stock prices to the particular event of interest.