PORTFOLIO MANAGEMENT

Portfolio Management

I Modern portfolio Theory [MPT]

"Risk of portfolio can be reduced with the help of diversification & such diversification depends upon correlation between two stocks"

1 Expected Return & Risk of Single stock

On the basis of past data [Ex post data]

Step 1 Annual return $= \frac{(P_1 - P_0) + \text{Income}}{P_0} \times 100$

Step 2 Expected Return $= \frac{\Sigma x}{n}$

Step 3 Standard deviation $= \sqrt{\frac{\Sigma (x-\bar{x})^2}{n}}$

On the basis of probability [Ex-Ante data]

Step 1 Expected return $= \Sigma (x-\bar{x})p$

Step 2 Standard deviation $= \sqrt{\Sigma (x-\bar{x})^2 p}$

"Select the stock having higher ER & Lower S.D."

Co-efficient of variation [CV]

"Risk with respected to return" Higher C.V. means Higher Risk"

$$C.V. = \frac{\sigma}{\bar{x}}$$

2 Expected Return & Risk of portfolio

$$ER_p = (ER_A \times w_A) + (ER_B \times w_B)$$

$$\sigma_p = \sqrt{\sigma_A^2 w_A^2 + \sigma_B^2 w_B^2 + 2 \times \sigma_A \times w_A \times \sigma_B \times w_B \times r_{AB}}$$

$(a+b)^2 = a^2 + b^2 + 2ab$

How to calculate correlation between two stocks ?

Step 1 Calculate Covariance between two stocks

$$Cov_{xy} = \frac{\Sigma (x - \bar{x})(y - \bar{y})}{n}$$

or

$$Cov_{xy} = \Sigma (x - \bar{x})(y - \bar{y}) p$$

Step 2 Calculate correlation x & y [r_{xy}]

$$r_{xy} = \frac{Cov_{xy}}{\sigma_x \times \sigma_y}$$

Derivation of COV formula = $Cov_{xy} = \sigma_x \times \sigma_y \times r_{xy}$

$$\sigma_p = \sqrt{\sigma_A^2 \times w_A^2 + \sigma_B^2 w_B^2 + 2 \times w_A \times w_B \times \sigma_A \times \sigma_B \times r_{AB}}$$

$\sigma_A \times \sigma_B \times r_{AB} \leftarrow Cov_{AB}$

Concept of correlation

Situation 1 If correlation is perfect Negative [-1]

"Zero Risk portfolio is possible"

Optimum weights $w_A = \frac{\sigma_B}{\sigma_A + \sigma_B}$ दूसरे का S.D. / दोनों का S.D.

$$\sigma_p = (\sigma_A \times w_A) - (\sigma_B \times w_B)$$

"Ignore negative sign of final answer"