



# RAMA UNIVERSITY

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**FACULTY OF COMMERCE AND MANAGEMENT**

**COURSE: BBA (DM)**

**SUBJECT: SECURITY AND PORTFOLIO MANAGEMENT**

**SUBJECT CODE: BBA (DM) 602**

**LECTURE: 6**

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# Measurement of Risk

Quantification of risk is known as measurement of risk.

**Two approaches are followed in measurement of risk:**

- (i) Mean-variance approach, and
- (ii) Correlation or regression approach.

# MEAN-VARIANCE APPROACH

Mean-variance approach is used to measure the total risk, i.e. sum of systematic and unsystematic risks. Under this approach the variance and standard deviation measure the extent of variability of possible returns from the expected return calculated as:

$$\sigma^2 = \sum_{i=1}^n [(X_i - \bar{X})^2 p(X_i)]$$

- Where,  $X_i$  = Possible return,
- $P$  = Probability of return, and
- $n$  = Number of possible returns

# CORRELATION OR REGRESSION METHOD

- Correlation or regression method is used to measure the systematic risk. Systematic risk is expressed by  $\beta$  and is calculated by the following formula:

$$\beta_i = \frac{r_{im} \sigma_i \sigma_m}{\sigma_m^2}$$

- Where,  $r_{im}$  = Correlation coefficient between the returns of stock i and the return of the market index,
- $\sigma_m$  = Standard deviation of returns of the market index, and
- $\sigma_i$  = Standard deviation of returns of stock i.

# REGRESSION METHOD

- Using regression method we may measure the systematic risk. The form of the regression equation is as follows:

$$Y = \alpha + \beta X$$

It is used in the following form

or

$$\alpha = \bar{Y} - \beta \bar{X}$$

and,

$$\beta = \frac{n \sum XY - (\sum X)(\sum Y)}{n \sum X^2 - (\sum X)^2}$$

- Where, n = Number of items,
- Y = Mean value of the company's return,
- X = Mean value of return of the market index,
- $\alpha$  = Estimated return of the security when the market is stationary, and
- $\beta$  = Change in the return of the individual security in response to unit change in the return of the market index.

# Concept of Return

- Return can be defined as the actual income from a project as well as appreciation in the value of capital. Thus there are two components in return—the basic component or the periodic cash flows from the investment, either in the form of interest or dividends; and the change in the price of the asset, commonly called as the capital gain or loss.