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"MEASUREMENT OF SYSTEMATIC AND UNSYSTEMATIC RISK: EMPLOYABILITY OF A RISK ANALYSIS & FINANCIAL FORECASTING MODEL OF STEEL AUTHORITY OF INDIA (SAIL)"

TRIPTI PANCHAL

GARGI COLLEGE, UNIVERSITY OF DELHI

A risk in holding securities is for the most part connected with the likelihood that acknowledged return will be not exactly the arrival that is expected. The wellspring of such frustration is the disappointment of profit (intrigue) and additionally, the security's cost appear obviously. In this way, chance alludes to the likelihood that an acknowledged return in securities will be not exactly the profits were normal. Powers that add to varieties in returns – cost or profit (intrigue) — comprise components of risk. A few impacts are outer to the firm, can't be controlled, and influence vast quantities of securities. Different impacts are inner to the firm and are controllable to an expansive degree. In ventures, those powers those are wild, outer, and expansive in their impact are called wellsprings of efficient risk. On the other hand, controllable, inside variables to some degree impossible to miss to enterprises as well as firms are alluded to as wellsprings of unsystematic risk

Types of Risks

Risk is of two types:

1. ***Systematic Risk Or Non diversifiable Risk***
2. ***Unsystematic Risk Or Diversifiable Risk***

Systematic risk

It refers to that bit of the complete inconstancy consequently caused by components influencing the costs everything being constant. Financial, political, and sociological changes are wellsprings of systematic risk. Their impact is to cause costs of almost all individual basic stocks and additionally all individual bonds to move together in same way.

Types of Systematic Risk

Systematic risks are of following types:

- ***Market Risk***
- ***Interest Rate Risk***
- ***Purchasing Power Risk***

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Market Risk: Consequent variability on most basic stocks that is because of essential far reaching developments in financial specialist desire is alluded to as market risk. Market chance reflects changes in the financial specialist demeanors toward values all in all that originate from substantial and immaterial occasions. Substantial occasions may incorporate desires for lower corporate benefits; impalpable occasions may be eruption to bring down expected benefits and the resultant frenzy moving.

Interest Rate Risk: Interest rate risk alludes to the vulnerability of future market esteems and of the measure of future pay, caused by vacillation by and large dimension of financing costs.

Purchasing Power Risk: Purchasing power risk is the vulnerability of the acquiring intensity of the sums to be gotten. It alludes to the effect of swelling or emptying on a venture.

Unsystematic Risk

It is that bit of the total risk that is special to a firm or industry. Factors, for example, the executive's ability, buyer inclinations, and work strikes cause orderly changeability in the profits of a firm. Unsystematic variables are to a great extent free of elements influencing securities advertises by and large. Since these components influence one firm, they should be inspected for each firm. Unsystematic variables are to a great extent free of elements influencing the securities showcase when all is said in done. Unsystematic risk is basically the contrast between the total risk and the systematic risk.

Types of Unsystematic Risk

Unsystematic risks are of following types:

- ***Business Risk***
- ***Financial Risk***

Business Risk

Business risk is that part of the unsystematic risk which is caused by the working condition of the business.

Financial Risk

Financial risk is related with the manner by which an organization funds its exercises, for example, the extent of debt and equity in its capital structure.

TOTAL RISK

Total risk of an investment consists of two components: diversifiable and nondiversifiable risk. The former risk can be almost entirely by holding a large mix of carefully selected securities. The only risk

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the investor is compensated for taking is thus nondiversifiable risk. **Beta measures this risk and can be used to determine the appropriate required return on a security.**

TOTAL RISK = SYSTEMATIC RISK+ UNSYSTEMATIC RISK

Measurement of Systematic and Unsystematic Risk

Calculation of Systematic Risk

Systematic risk is estimated by security's beta (β). Beta shows how the cost of security reacts to advertise powers. The beta coefficient is the incline of the relapse line with security return as needy variable and market return as autonomous variable and along these lines, it is a proportion of the affectability of stock return developments in market return. In actuality, the more responsive the cost of security is to changes in the market, the higher will be its beta.

$$\beta = \frac{N\,\Sigma XY - \Sigma X \Sigma Y}{N\Sigma X^2 - (\Sigma X)^2}$$

Systematic risk is the product of variance of sensex and $(\beta)^2$

SYSTEMATIC RISK = VARIANCE OF SENSEX * β²

Where,

$$\text{Variance Of Sensex } (\Sigma x^2) = \frac{\sum (X - X_{mean})^2}{N}$$

Calculation of Unsystematic Risk

UNSYSTEMATIC RISK=TOTAL RISK – SYSTEMATIC RISK

(Total Risk = Variance of Security)

$$\text{Variance Of Security } (\Sigma y^2) = \frac{\sum (Y - Y_{mean})^2}{N}$$

Where,

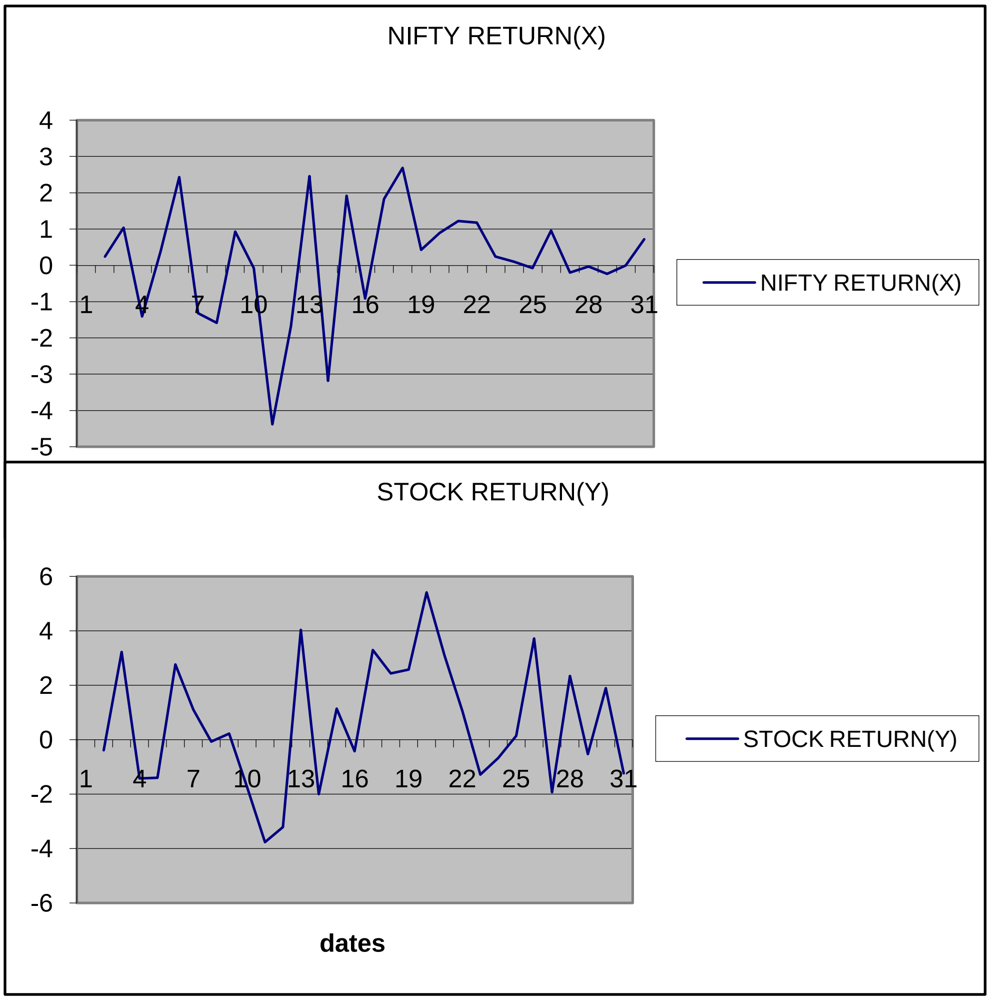
X = MARKET RETURN

Y = SECURITY RETURN

The beta for the overall market is equal to 1 and other betas are viewed in relation to this value.
For example, if the market return is 10% over the next year, a stock having a beta of 1.80 would be expected to experience an increase in return of approximately 18% over the same period. This particular stock is much more volatile than the market as a whole.
Stocks having betas of less than 1 will ofcourse be less responsive to changing returns in the market and therefore are less risky.

Analysis of Risk of SAIL Company

We have taken closing stock prices of MTNL and NSE's closing prices for 31 continuous trading days in order to calculate the systematic and unsystematic risk for 30 days for the company.
With the help of the closing prices, we have calculated the return on stock and market return for the 30 days. The variation in the return of the company and NSE can be showed with the help of the following charts.



Calculation of Systematic Risk and Unsystematic Risk

Total Risk = Systematic Risk + Unsystematic Risk

Total Risk Is Measured By Σy2.

Variance Of Stock (σy^2) $= \dfrac{\sum(Y-Y_{mean})^2}{N}$

$= \dfrac{155.023}{30}$

$= \mathbf{5.1674}$

Variance of Nifty (σx^2) $= \dfrac{\sum(X-X_{mean})^2}{N}$

$= \dfrac{72.3938}{30}$

$= \mathbf{2.4131}$

Beta (β) $= \dfrac{N\sum XY - \sum X \sum Y}{N\sum X^2 - (\sum X)^2}$

$= \dfrac{30*77.302 - 4.4945*18.51}{30*73.067 - (4.4945)^2}$

$= \dfrac{2319.06 – 83.1932}{2192.01 – 20.2005}$

$= \dfrac{2235.867}{2171.81}$

$= \boldsymbol{1.0295}$

Systematic Risk = Variance Of Nifty * β^2

$= 2.4131 * (1.0295)^2$

$= \boldsymbol{2.5576}$

Unsystematic Risk = Total Risk - Systematic Risk

$= 5.1674 - 2.5576$

$= \boldsymbol{2.6098}$

SYSTEMATIC RISK IS 49.50% WHEREAS UNSYSTEMATIC RISK IS 50.50%.

Characteristic Line for SAIL Stock

$R_{S} = \alpha + \beta_S(R_M)$

Where, R_s= required return on security

R_m= required return on market index

β_s = beta of security

Since B is 1.0295 which is more than 1, suggests that SAIL STOCK is more volatile than the Market Index.

$\alpha = Y_{mean} - \beta_S(X_{mean})$

$= .617-1.0295(.14982)$

$= .617-.1542$

$= .4628$

An alpha of .4628 suggests that return on sail stock will be positive if the market is going flat, that is neither going up or down. If the alpha is negative it means negative returns on the security if the market goes flat.

This stock has a beta of 1.0295 which recommends that this stock is forceful in connection to the market index. In this way, it might be said at the end that arrival on SAIL stock is similarly influenced by the inner components of the firm, for example, the executives capacity, shopper inclinations, and work

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strikes as and the monetary, political, and sociological changes which are outer to a firm. SYSTEMATIC RISK IS 49.50% WHEREAS UNSYSTEMATIC RISK covers 50.50% of the total risk.