

Examination of Risk- Returns Characteristics of Five Major Stocks in Different Sector

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ABSTRACT

This study examines risk-return characteristics of individual securities. Five major stocks in different sectors which are Tata motors, Tata Consultancy Services (TCS), HCL Technologies, Sun pharma and Bharti Airtel have been studied over the period 1st April 2012 to 31st March 2017. The study focuses on the various techniques employed for the evaluation of the performance of a portfolio. This work will be beneficial to all stake holders dealing with stock market. The study concluded that, investors should be more conscious while evaluating the performance of securities. Investor can consider the variation in economic factors and its impact on security price. While selecting the securities it is advisable to have a detailed analysis of each and every security with respect to their risk-return characteristics.

Keywords: Systematic Risk, Unsystematic Risk, Beta, Alpha, Return

INTRODUCTION

This study mainly focuses on analyzing the portfolio risk and performance evaluation. This study is based on five companies selected from those listed in Bombay Stock Exchange, belonging to different sectors, and thereby finding out that how an ideal portfolio should be planned such that the investor gets the maximum return out of the investment made and fulfilling his liquidity requirement simultaneously. It also aims at studying the various types of risk factors that are associated with each security.

The study is only related to the Indian capital market situations. The methods and techniques followed in the study are highly relevant and efficient. Therefore the study can give a basic picture of portfolio construction and evaluation. The scope of the study is limited to the Indian stock market.

The main objective of this study is to analyze the performance of selected five securities in different sector through security Analysis. The risk and return of selected five securities are analysed here.

The major source of the Secondary data is the website of BSE India. Text books, company's website are also used to collect secondary data. Some of the modern techniques are applied here to understand security analysis. The data used for the study is presented in the form of tables, charts, graph etc.

Beta of Security

The Beta value indicates the measure of systematic risk of the security. Beta describes the relationship between the stock return and the market index return. Beta of security may be positive, negative, or zero. The beta of an asset is a measure of variability of that asset relative to the variability of the market as a whole. Beta is an index of the systematic risk of an asset.

$$\beta_i = \frac{N \sum xy - \sum x \sum y}{N \sum x^2 - (\sum x)^2}$$

Where; N= Number of security, Y = Return of security, X = Return of Market.

Alpha of security

The alpha value indicates the extra return earned by the stock over and above the market return. Alpha measures the unsystematic risk of a security.

$$\text{Return of Stock} = \text{Alpha} + (\text{Beta} \times \text{Market return per year})$$

$$\text{Alpha } (\alpha) = R_i - (\beta_i \times R_m)$$

Where,

$$A = \text{Alpha of the security} \quad R = \text{Return of the security}$$

$$B_i = \text{Beta of the security} \quad R_m = \text{Return of the market}$$

Risk (Total Risk)

$$\sigma_i^2 = \frac{[\sum (X_i - X)^2]}{n}$$

$$\sigma_i = \sqrt{\frac{[\sum (X_i - X)^2]}{n}}$$

Where;

$$\sigma_i^2 = \text{Total risk of the security} \quad X_i = \text{Return of security per annum}$$

$$X = \text{Mean return of security per annum} \quad n = \text{Number of observations}$$

The total risk of an individual security consists of two components.

Systematic Risk

The market related risk is called systematic risk. The impact of economic, political and social changes is system-wide and that portion of total variability in security returns caused by such system-wide factors is referred to as systematic risk. It is further classified into interest rate risk, market risk and purchasing power risk.

$$\text{Systematic Risk} = \beta_i^2 \times \sigma_m^2$$

Where;

$$\beta_i = \text{Beta value of the security} \quad \sigma_m^2 = \text{Variance of the market index}$$

Unsystematic Risk

The unique risk of that particular security called unsystematic risk. The returns from a security may sometimes vary because of certain factors affecting only the issuing company of such security. When variability of returns occurs because of such firm-specific factors, it is known as unsystematic risk. The unsystematic or unique risk affecting specific securities arises from two sources: a) the operating environment of the company, and b) the financing pattern adopted by the company. These two types of unsystematic risk are referred to as business risk and financial risk respectively.

$$\text{Unsystematic risk} = \sigma_i^2 - \beta_i^2 \times \sigma_m^2$$

Where;

$$\sigma_i^2 = \text{Total risk of the security } i$$

$$\beta_i = \text{Beta value of the security}$$

$$\sigma_m^2 = \text{Variance of the market index}$$

Return of Securities

$$R_i = \frac{[(P_E - P_B) \div P_B] \times 100}{1}$$

Where;

$$R_i = \text{Return of the security } i$$

$$P_E = \text{Today's price for the security}$$

$$P_B = \text{Yesterday's price for the security}$$

Annual Average of Return of Security

$$R_i = \frac{\sum x}{N}$$

Where; $\sum x$ = Sum total of returns of all samples N = No of samples

Portfolio Return

$$R_p = \alpha_p + (\beta_p \times R_m)$$

Where;

$$\alpha_p = \text{Alpha value of the portfolio}$$

$$\beta_p = \text{Beta value of the portfolio}$$

$$R_m = \text{Return of the market index}$$

Portfolio Risk

$$\sigma_p^2 = \beta_p^2 \sigma_m^2 + \sum \omega_i^2 \sigma_{ei}^2$$

Where;

$$\beta_p = \text{Beta value of the portfolio} \quad \sigma_m^2 = \text{Variance of market index}$$

$$\omega_i = \text{Weight of the security} \quad \sigma_{ei}^2 = \text{Residual variance of the security}$$

METHODOLOGY

Statement of the problem

Portfolio setting and management is the biggest hurdle every investor faces while entering to stock market. Selecting best stock from thousands need through knowledge in the area. There are many malpractices in this field. In India investors and market participants faces many issues while filling their cart. This work will be beneficial to all these participants to evaluate the performance of five stocks which belongs to major sectors.

Stocks selected

This study is to analyze the performance of selected five securities in different sector Tata Motors, TCS, HCL, Sun Pharam and Bharti Airtel which are the major players in their respective sectors

Objectives of the Study

- To analyze the performance of selected five securities in different sector through security Analysis.
- To know risk and return of selected five securities.
- To know systematic and unsystematic risk of selected securities.

Tools used for data analysis

Alpha of security (α) = $R_i - (\beta_i \times R_m)$

Risk (Total Risk)

$$\sigma_i^2 = \frac{[\sum (X_i - \bar{X})^2]}{n}$$

$$\sigma_i = \sqrt{\frac{[\sum (X_i - \bar{X})^2]}{n}}$$

Systematic Risk = $\beta_i^2 \times \sigma_m$

Unsystematic risk = $\sigma_i^2 - \beta_i^2 \times \sigma_m^2$

Return of Securities $R_i = \frac{(P_E - P_B)}{P_B} \times 100$

Portfolio Return $R_p = \alpha_p + (\beta_p \times R_m)$

DATA ANALYSIS AND INTERPRETATION

Beta of the Securities

SECURITY	BETA
TATA MOTORS	1.423210
TCS	0.477476
HCL	1.551261
SUN PHARMA	0.693795
BHARTI AIRTEL	0.693795

Beta value is highest value for HCL (1.55126) that show above average risk(more than 1.0) and lowest value for TCS(0.4774) that mean below average risk(less than 1.0).

Alpha of the Securities

SECURITY	ALPHA
TATA MOTORS	-2.468824
TCS	10.731795
HCL	-2.736735
SUN PHARAM	1.79653
BHARTI AIRTEL	-6.22762

TCS has the highest value of alpha (10.7317)indicating that it has maximum extra return and BHARTI AIRTEL has the lowest value alpha value (-6.2276).security TATA MOTORS and HCL have got negative alpha value

ALPHA CALCULATION

Alpha = $R_i - (\beta_i \times R_m)$

R_i = Return of the security

B_i = Beta of the security

R_m = Return of the market

TATA MOTORS	-2.46145
TCS	10.7317958
HCL	-2.7367351
SUN PHARMA	1.79653
BHARTI AIRTEL	-6.2276

SYSTEMATIC RISK

SECURITY	β_i	β_i^2	σ_m^2	SYSTEMATIC RISK ($\beta_i^2 \times \sigma_m^2$)
TATA MOTORS	1.4233210	2.025527	213.8266	433.1116
TCS	0.447476608	.227984	213.8266	48.74903
HCL	1.551261707	2.406413	213.8266	514.7490
SUN PHARMA	0.6937950	0.481352	213.8266	102.9257
BHARTI AIRTEL	0.82737338	0.684547	213.8266	146.374318

The systematic risk or market risk is highest value for HCL (514.749) and the market risk is lowest for TCS (48.74903).

CALCULATION OF SYSTEMATIC RISK

Systematic Risk = $\beta_i^2 \times \sigma_m^2$

Where;

β_i = Beta value of the security
 σ_m^2 = Variance of the market index

TATA MOTORS	433.1116
TCS	48.74903
HCL	514.749031
SUN PHARMA	102.92577
BHARTI AIRTEL	146.3743

UNSYSTEMATIC RISK

Security	σ_i	σ_i^2	$\beta_i^2 \times \sigma_m^2$	unsystematic risk = $\sigma_i^2 - \beta_i^2 \times \sigma_m^2$
TATA MOTORS	35.47002	1258.122	433.1115	825.0125
TCS	23.664	560.2625	48.7494	511.5135
HCL	56.63768	3207.827	545.551	2693.2727
SUN PHARAMA	35.39731	1252.97	102.9258	738.4144
BHARTI AIRTEL	29.77064	886.2908	146.3743	739.9165

The unsystematic risk or Residual Variance is highest value for HCL (2693.272) and is lowest value for TCS (511.513).

Calculation of Unsystematic Risk

Unsystematic risk = $\sigma_i^2 - (\beta_i^2 \times \sigma_m^2)$

Where;

σ_i^2 = Total risk of the security i
 β_i = Beta value of the security
 σ_m^2 = Variance of the market index

TATA MOTORS	825.01085
TCS	511.5135
HCL	2693.272

SUN PHARMA	738.414431
BHARTI AIRTEL	739.91650

TOTAL RISK OF SECURITIES

Total risk = Systematic risk + Unsystematic risk

SECURITY	SYSTEMATIC RISK(A)	UNSYSTEMATIC RISK(B)	TOTAL RISK(A+B)
TATA MOTORS	433.11164	825.01085	1258.122
TCS	48.749031	511.5135	560.2625
HCL	514.5551	2693.272	3207.827
SUN PHARAM	102.92.9257	738.4144	841.3402
BHARIT AIRTEL	146.3743	739.916508	886.2908

The total risk highest value for HCL (3207.827) and the risk is lowest for TCS (560.2625)

RETURN OF SECURITIES

SECURITY	RETURN
TATA MOTORS	16.8482
TCS	17.2125
HCL	18.3184
SUN PHARAM	11.2133
BHARTI AIRTEL	5.0022

The Return is highest for the security HCL (18.318) that indicating has more risk and the return is lowest value for BHARTI AIRTEL (5.002242).

RETURN CALCULATION

Return per day

$$\text{Average return per day} = \frac{\sum R_i}{N}$$

Where;

$$\begin{aligned} \sum R_i &= \text{sum total of return of the day} \\ N &= \text{number of days} \end{aligned}$$

Annual return

$$\text{Average annual return} = \text{Return per day} \times 250$$

	Return per day	Annual return
TATA MOTORS	0.067393	
TCS	0.06885016	17.212
HCL	0.07327	18.31839
SUN PHARMA	0.04485	11.21334
BHARTI AIRTEL	.020008	5.0024

FINDINGS

Beta:

- Beta value is highest value for HCL (1.55126) that show above average risk(more than 1.0) and lowest value for TCS(0.4774) that mean below average risk(less than 1.0).

Alpha:

- TCS has the highest value of alpha (10.7317) indicating that it has maximum extra return and BHARTI AIRTEL has the lowest value alpha value (-6.2276). security TATA MOTORS and HCL have got negative alpha value

Systematic Risk:

- The systematic risk or market risk is highest value for HCL (514.749) and the market risk is lowest for TCS (48.74903).

Unsystematic Risk:

- The unsystematic risk or Residual Variance is highest value for HCL (2693.272) and is lowest value for TCS (511.513).

Return:

- The Return is highest for the security HCL (18.318) that indicating has more risk and the return is lowest value for BHARTI AIRTEL (5.002242).

CONCLUSION

The study has done by considering major securities traded at Bombay Stock Exchange. In security analysis it is found that, Beta value is highest for the security HCL and lowest value for TCS. The TCS security has the highest alpha value and BHARTI AIRTEL has that of lowest value. The systematic risk or market risk is highest value for the security HCL and lowest for TCS. The unsystematic risk or Residual Variance is highest value for HCL security and is lowest value for TCS. The return of security shows highest value for HCL and lowest value for BHARTI AIRTEL. The study reveals that when an investor selecting the securities, he has to analyze each and every security with respect to their risk-return characteristics. Conducting security analysis will be helpful in better investment decision in the choice of various securities. The investors can not only consider present return but also forecast the future growth of the securities He can use scientific methods for construction and selection of portfolios. For the evaluation of portfolio, Sharpe Ratio, Treynor Ratio and Jensen Measure will be useful. Thus, all these tools and analysis will help the investor for the right decision in the stock market.

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