

Asset Pricing and Volatility of Indian Stock Market

P. Sumalatha, Settypalli Raghavendra, Telugu Sudharani

ABSTRACT: This paper shows a basic market portion model of two sorts of dealers, for example, fundamentalists and chartists under a market situation. It is discovered that the Asset costs, riches elements and market conduct are portrayed by the elements of the basic deterministic framework. We give the hypothetical and exact contentions for a recessed shape for the security advertise line, or a reducing minimal premium for showcase hazard. In capital market balance with basic portfolio limitations, various financial specialists by and large hold various arrangements of theoretical or tricky protections. We show that the volatility depends on covariance of aggregate risk aversion and the stock returns. We found that the heterogeneity increases volatility and thereby it leads in rise of beta. Here the statistical approach is provided to estimate the volatility of the assets included in the portfolio. This paper draws out the connection between the alpha (returns) and beta (hazard). A sober minded examination of securities exchange information affirms the presence of a critical and solid, inward cross-sectional connection between normal return and gauge past market beta. This paper additionally reports a descending slanting of security advertises line, which is more bewildering than the normal and customary "smoothed" SML. We additionally found that the incline of SML turns out to be increasingly "modified" when speculators become overweening with expanded exchanging volume. Here high-beta stocks are the most exchanged stocks and are connected with the least hazard balanced returns and bringing about a way more noteworthy gainfulness of the wagering against-beta. Hence the asset pricing can be made with the help of security market line or characteristic line which best describes the prominent attributes of the securities that are leaping on the market line. The Capital asset pricing model can be perfectly justified with the help of SML.

Keywords: Volatility, Capital market equilibrium, Asset pricing, Market beta, Capital asset pricing model, Security market line.

I. INTRODUCTION

A great deal of speculators exchanging the money related markets with protections and stocks are attempting to anticipate the market developments with the assistance of open data from various sources.

This may concern the inquiry that will protections with higher imminent advantages get more prominent incomes when contrasted with protections with lower planned advantages. These thoughts can be analyzed utilizing time look into and more profound investigation. In the event that a security is portrayed exactly, the following return of the security will go to the beta at the protections showcase line.

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All things considered, on the off chance that it goes down that line at that point that expresses the security is underestimated and it is above the line it expresses that the security is misrepresented. In any circumstance, guidelines must be executed. Security advertise line is a line that shows the dangers against income inside the exchanging market at an endorsed time and can exposed every one of the protections that are in a decent interest. It is additionally called trademark line or Security Market Line. Security advertises line truly shows the result of the budgetary capital resource valuing model. It is additionally called Capital Asset Pricing Model equation. The Capital Asset Pricing Model (Sharpe, 1964; Lintner, 1965) outline the connection between orderly hazard and anticipated return for resources, especially stocks. CAPM is generally utilized all through account for estimating dangerous protections and making expected returns for resources given the danger of those benefits and cost of capital. Resource evaluating models are endeavors to characterize the connection between the hazard and return. In SML chance available is spoken to through the X-pivot likewise called beta. Imminent income or expected return is spoken to through the Y-pivot. Protections chance premium is recognized with the assistance of security advertise line.

II. LITERATURE REVIEW

Lintner (1965) and Douglas (1969): The principal investigations of the CAPM depended essentially on singular security returns and featured the hazard return relationship. Their observational outcomes were not empowering. Truth be told, the two researchers found that the catch has values a lot bigger than the hazard free pace of return, while the coefficient of beta factually has a lower esteem.

Mill operator and Scholes (1972): They found the equivalent factual issues when utilizing individual securities profits in testing the legitimacy of the CAPM. Moreover, different investigations ached this issue by utilizing portfolio returns.

Dark (1972): He shaped arrangement of the considerable number of supplies of the New York Stock Exchange over the period 1931–1965. Their proof demonstrates that the normal extra profit for a benefit isn't carefully relative to its β , and we accept that this proof is abundantly solid to warrant dismissal of the customary type of the model given by Sharpe (1964).

S. Kevin (1980): In his book "Portfolio Management" he discusses venture choices and different approaches to decrease hazard and different focuses to be noted before making a speculation. As per Kevin, Return and hazard are two head qualities of each venture. Speculators base their venture choice on the normal return and danger of speculations. Hazard is estimated by the changeability in returns. Financial specialists look to lessen the fluctuation of profits through enhancement of speculation. This results in the production of a portfolio.

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Expansion assists with bringing down the hazard, however even a well-enhanced portfolio doesn't become chance free.

Charles P. Jones (1985): In the book "Speculations - Analysis and Management" he discusses significance of making a monetary arrangement and different techniques and models utilized for contributing. As indicated by Charles speculation of assets in different resources is just piece of the general budgetary basic leadership and arranging that most people must do. Financial specialists ought to expect a hazard premium for purchasing an unsafe resource, for example, a stock. The more noteworthy the danger of that stock, the higher the hazard premium ought to be. Various stocks will influence a well-expanded portfolio in an unexpected way. The significant hazard for an individual stock is its commitment to the danger of a well-differentiated portfolio and is the market chance or orderly hazard, which is non-diversifiable.

III. NEED FOR THE STUDY

The following are the reasons to take up this study. The first reason is, stock markets have become fascinating investment options for the common man. But the need is to be able to effectively and efficiently manage investments in order to keep maximum returns with minimum risk. The second reason is, CAPM and Security market line helps investors in effective and efficient management of their investment to achieve this goal. The rapid growth of capital markets in India has unfurled up new investment avenues for investors. The third reason is Asset pricing, CAPM, Security market line and volatility to examine the role process and benefits of effective investment management and decision.

IV. OBJECTIVES OF THE STUDY

The following objectives are considered in this study.

1. To investigate the risk-return attributes of pilot scrips with the assistance of CAPM and SML
2. To learn Security advertise line Position with the assistance of accepted or made portfolio
3. To develop a successful Security showcase line which offers the most extreme return for least risk?
4. To gauge the overrated and undervalued protections

V. RESEARCH METHODOLOGY

Various statistical techniques are used to analyze the collected data. They are averages, regression analysis, co-variance, standard deviation. To support the analyzed data, tables are used wherever it is necessary. This study is based on constituents of Nifty50 index. The time period covered is 3 years i.e. from 1st April, 2016 to 31st march, 2019. The data is collected mainly from secondary source i.e. annual

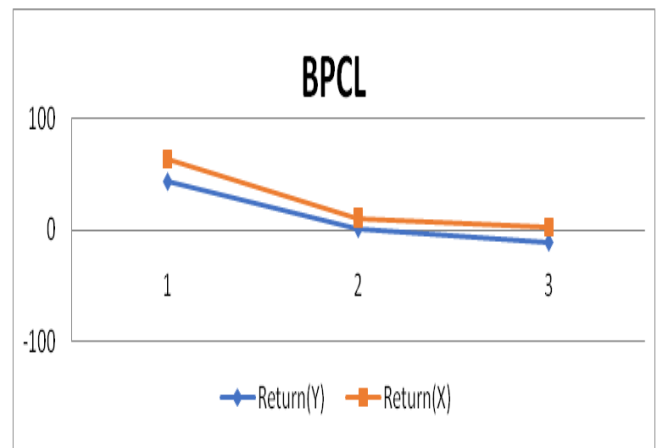
reports, monthly reports, and data from NSE and from the journals of the required companies. Five types of sectors are taken into consideration from market and five companies are taken from each sector. The five selected sectors are information technology, infrastructure, oil, banking and non-banking financial sectors. The risk and return are analyzed for each security of the selected companies. As stated, the objective of this study is to test the capital asset pricing model in Indian stock market.

VI. RESULTS AND DISCUSSION

Table-1: BPCL (Oil Industry)

Date (Years)	Return of Nifty (X)	Return of BPCL (Y)	D ² (D= diff. b/w Y & avg. of Y)	X ²	X*Y
01-04-2016 to 31-03-2019 (n=3 years)	42.25205	34.39602	1648.936	639.777	693.073

***Note:** Here the summation of each variable is considered and they are derived from real time data.



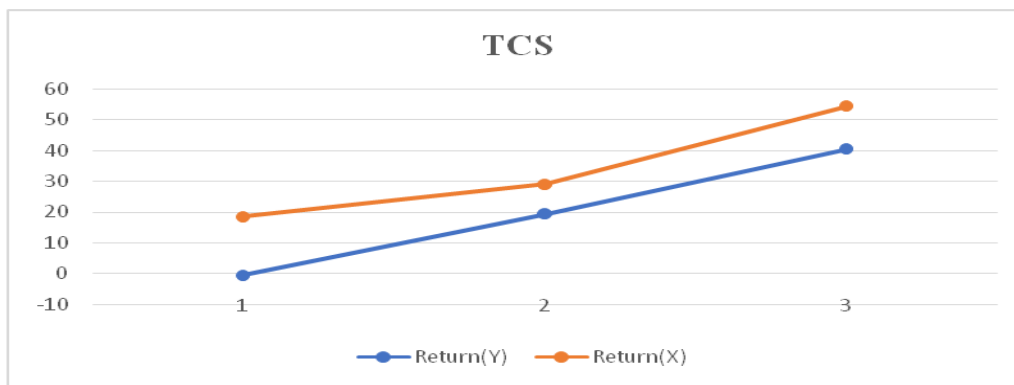
Analysis: The equity of the company BPCL is showing average returns of 11.465 and expected return according to security market line is 15.246 and the risk is 1.083. Hence the security is overvalued and it comes below the security market line.

RISK = $\sqrt{\frac{\sum D^2}{n-1}} = \sqrt{\frac{1648.936}{(3-1)}} = 824.468$,
SML: $E(R_i) = R_f + \beta_i [E(R_m) - R_f]$, $R_f = 7.9\% = 0.079$, $R_m = \text{average (market return)} = 42.25205/3 = 14.084016$, $\beta_i = (\sum XY / \sum X^2) = 693.073/639.777 = 1.083$, **Hence SML:** $E(R_i) = R_f + \beta_i [E(R_m) - R_f]$, $E(R_i) = 0.079 + 1.083(14.084 - 0.079) = 15.246$

Table-2: TCS (IT Industry)

Date (years)	Return of Nifty (X)	Return of TCS (Y)	D ² (D= diff. b/w Y & avg. of Y)	X ²	X*Y
1-04-2016 to 31-03-2019 (n=3 years)	42.25205	59.48646	835.2528	639.777	736.4937

Note: Here the summation of each variable is considered and they are derived from real time data.



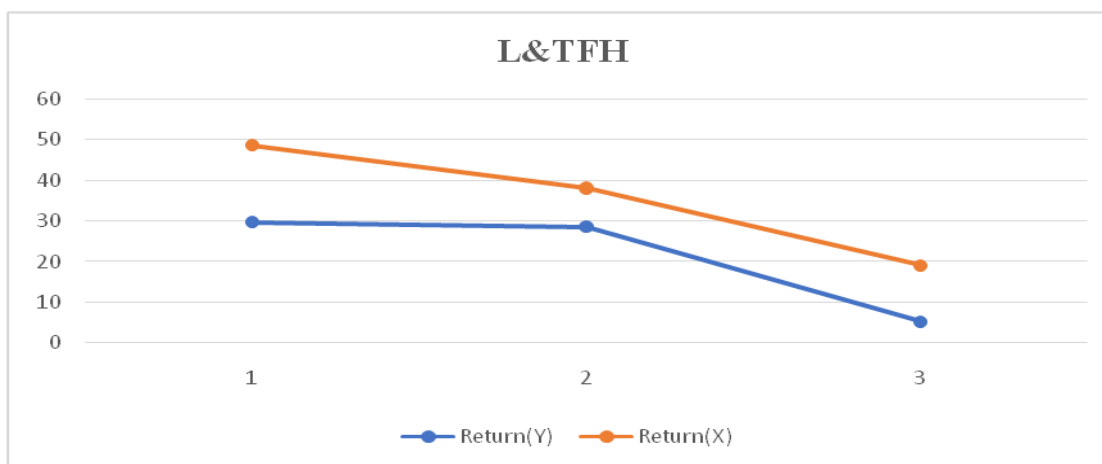
Analysis: The equity of the company TCS is showing average returns of 19.828 and expected return according to security market line is 16.198 and the risk is 1.151. Hence the security is undervalued and it comes above the security market line.

RISK = $\sqrt{(\sum D^2 / (n-1))} = \sqrt{(835.2528 / (3-1))} = 417.629$,
SML: $E(R_i) = R_f + \beta_i [E(R_m) - R_f]$, $R_f = 7.9\% = 0.079$, $R_m =$
average (market return) = $42.25205 / 3 = 14.084016$, $\beta_i =$
 $(\sum XY / \sum X^2) = 736.4937 / 639.777 = 1.151$, **Hence SML:**
 $E(R_i) = R_f + \beta_i [E(R_m) - R_f]$, $E(R_i) = 0.079 + 1.151(14.084 - 0.079) = 16.198$

Table-3: L&TFH (Non-Banking Industry)

Date (years)	Return of Nifty (X)	Return of L&TFH (Y)	D ² (D= diff. b/w Y & avg. of Y)	X ²	X*Y
1-04-2016 to 31-03-2019 (n=3 years)	42.25205	63.64293	378.6471	639.777	907.0241

Note: Here the summation of each variable is considered and they are derived from real time data.



Analysis: The equity of the company L&TFH is showing average returns of 21.214 and expected return according to security market line is 19.924 and the risk is 1.417. Hence the security is undervalued and it comes above the security market line.

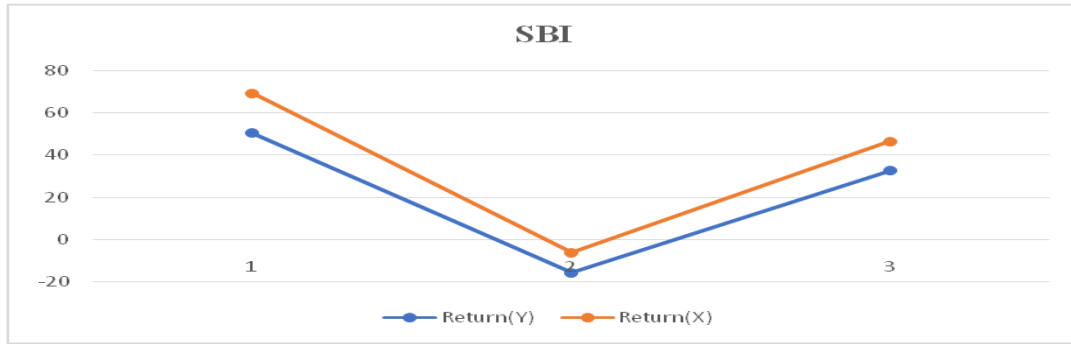
RISK = $\sqrt{(\sum D^2 / (n-1))} = \sqrt{(378.6471 / (3-1))} = 189.32355$,
SML: $E(R_i) = R_f + \beta_i [E(R_m) - R_f]$, $R_f = 7.9\% = 0.079$, $R_m =$
average (market return) = $42.25205 / 3 = 14.084016$, $\beta_i =$
 $(\sum XY / \sum X^2) = 907.024 / 639.777 = 1.4177$, **Hence SML:**
 $E(R_i) = R_f + \beta_i [E(R_m) - R_f]$, $E(R_i) = 0.079 + 1.417 (14.084 - 0.079) = 19.924$

Table-4: SBI (Banking Industry)

Date (years)	Return of Nifty (X)	Return of SBI (Y)	D ² (D= diff. b/w Y & avg. of Y)	X ²	X*Y
1-04-2016 to 31-03-2019 (n=3 years)	42.25205	67.50674	2310.911	639.777	1257.168

Note: Here the summation of each variable is considered and they are derived from real time data.

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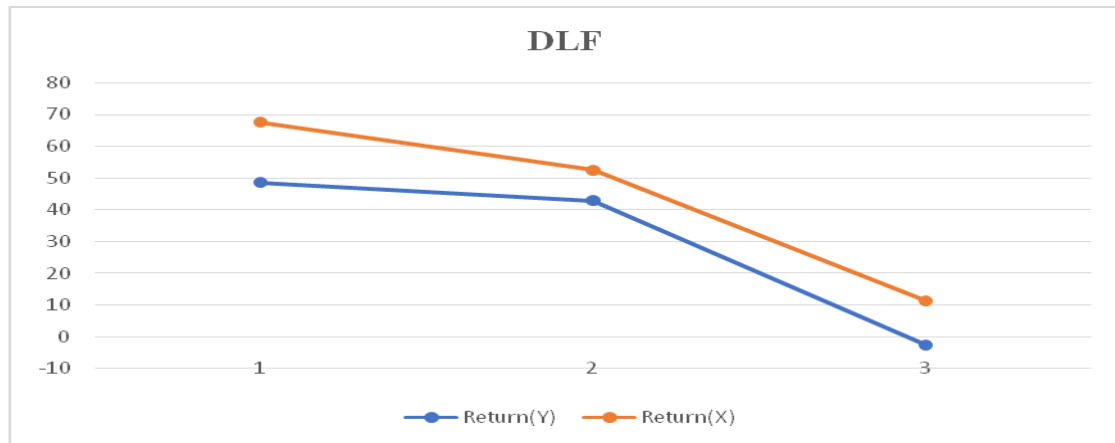
Analysis: The equity of the company SBI is showing average returns of 22.505 and expected return according to security market line is 27.598 and the risk is 1.965. Hence the security is overvalued and it comes below the security market line.

RISK = $\sqrt{(\sum D^2 / (n-1))} = \sqrt{(2310.911 / (3-1))} = 1155.455$,
SML: $E(R_i) = R_f + \beta_i [E(R_m) - R_f]$, $R_f = 7.9\% = 0.079$, $R_m =$
average (market return) = $42.25205 / 3 = 14.084016$, $\beta_i =$
 $(\sum XY / \sum X^2) = 1257.168 / 639.777 = 1.965$, **Hence SML:**
 $E(R_i) = R_f + \beta_i [E(R_m) - R_f]$, $E(R_i) = 0.079 + 1.965(14.084 - 0.079) = 27.598$

Table-5: DLF (Infrastructure Industry)

Date (years)	Return of Nifty(X)	Return of (Y)	D ² (D= diff. b/w Y & avg. of Y)	X ²	X*Y
1-04-2016 to 31-03-2019 (n=3 years)	42.25205	89.06403	1560.298	639.777	1292.423

Note: Here the summation of each variable is considered and they are derived from real time data.

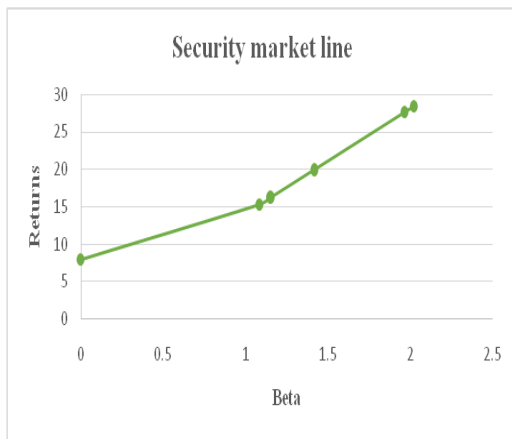


Analysis: The equity of the company DLF is showing average returns of 29.688 and expected return according to security market line is 28.369 and the risk is 2.020. Hence the security is undervalued and it comes above the security market line.

RISK = $\sqrt{(\sum D^2 / (n-1))} = \sqrt{(1560.298 / (3-1))} = 780.149$,
SML: $E(R_i) = R_f + \beta_i [E(R_m) - R_f]$, $R_f = 7.9\% = 0.079$, $R_m =$
average (market return) = $42.25205 / 3 = 14.084016$, $\beta_i =$
 $(\sum XY / \sum X^2) = 1292.423 / 639.777 = 2.020$, **Hence SML:**
 $E(R_i) = R_f + \beta_i [E(R_m) - R_f]$, $E(R_i) = 0.079 + 2.020(14.084 - 0.079) = 28.3691$

Table-6: Security Market Line (SML)

COMPANIES	BETA	RETURNS
Rf (Risk free rate)	0	7.9
BPCL	1.083	15.246
TCS	1.151	16.198
L&T	1.417	19.924
SBI	1.965	27.598
DLF	2.02	28.369



VII. CONCLUSION

The security market line is a helpful device in learning whether a benefit being considered for a portfolio offers an adequate anticipated return for hazard. Singular protections are plotted on the SML chart. In the event that the security's hazard versus expected return is plotted over the SML, it is underestimated in light of the fact that the financial specialist can anticipate a more noteworthy return for the instilled hazard. A security plotted beneath the SML is exaggerated on the grounds that the financial specialist would be tolerating less return for the measure of hazard figure. SML is a model, which helps in the identification of portfolios and individual securities as overvalued and undervalued with the help of CAPM. SML is used to make representation and judgment about individual securities. In the long run only the efficient portfolios and efficient securities lying on the SML are the best options for investments. An efficient portfolio is one for which actual returns and expected returns are equal. For undervalued portfolio or securities; actual return is more than the expected return calculated as per SML equation, whereas for an overvalued portfolio or securities, actual return is less than expected return calculated as per the SML equation. A rational investor would constantly examine his chosen Security market both for average return and risk. With respect to the hazard every financial specialist is at last intrigued by eccentric inconstancy pace of profit for their portfolio. In this way, the speculator's compensation for bearing danger, regardless of whether at the degree of portfolio or at the degree of an individual security held in that portfolio, relies on the deliberate hazard (beta) of that portfolio. A negative beta would occur if the correlation between the asset and market return is negative. In case of negatively correlative securities the risk can be reduced to a zero (which is company's risk) but the market risk will be the same for the security or stock in the Security market. In case of perfectly correlated securities or stocks, the risk can be reduced to a lowest point.

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