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A STUDY ON CAPITAL MARKET LINE AT HDFC SECURITIES

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ABSTRACT

In India, capital market line is now a distinct field of study. The rational investment decision-making process is now central to portfolio theory, which is a part of the financial literature. Using metrics including projected returns, volatility, and systematic risk, this research assesses five firms' investing potential. Among the businesses that have been studied are Vaibhav Global, Tata Steel, Bajaj Auto, Bharat Dynamics, and TVS Electronics. The results show that all of the companies had negative average returns, and that there was a wide range of volatility and systematic risk. It is advised to proceed with caution and closely observe for indications of stability before contemplating any investment. By drawing attention to the disparity between anticipated and actual results, the conclusion stresses the significance of careful observation and patience. In the end, holding out on making investment decisions until performance improves could reduce risk.

INTRODUCTION

Among the most crucial ideas in contemporary investment management and portfolio theory is the Capital Market Line (CML). It was modified using the Capital Asset Pricing Model (CAPM) and built upon the ground-breaking work of Harry Markowitz on portfolio optimisation. The link between the expected return and total risk, as measured by standard deviation, is depicted by the Capital Market Line. This line applies to efficient portfolios. For every given risk level, it displays all potential combinations of a risk-free asset and the market portfolio that maximise projected return. The Capital Market Line is a tool for financial market investors to use in their pursuit of maximum return with minimum risk. Diversification, including the inclusion of both risky and risk-free investments, can boost portfolio performance, as this example shows. Consequently, the CML is now an essential instrument for making financial decisions, allocating assets, managing portfolios, and analysing mutual funds.

If you take an efficient portfolio that includes both risk-free and market-based assets and plots them against each other, you'll see what's called the Capital Market Line. On the vertical axis is the risk-free rate of return, and at one point called the tangency portfolio it reaches the efficient frontier. It then continues upward via the market portfolio. For each given amount of overall risk, there exists an ideal portfolio that, at any given location on the Capital Market Line, provides the highest potential expected return. Under typical market circumstances, a portfolio that is located above the CML is theoretically impossible to achieve, while a portfolio that is located below the line is inefficient because it offers fewer returns for the same level of risk. Consequently, investors can use the Capital Market Line as a yardstick to measure the efficacy of their investment portfolios and find the optimal risk-return combinations that are now available.

Several essential elements form the basis of the Capital Market Line's idea. An investment that offers a guaranteed return with almost little danger of loss is called a risk-free asset, and it is the first component. The backing of the government makes treasury bills and other government securities seem like safe investments.

REVIEW OF LITERATURE

1. **A Test of Risk–Return Relationship for Stocks Traded on the NSE**
   Author: N. Lalitha
   Year: 2025

Abstract:

By applying the Capital Asset Pricing Model (CAPM), this research looked at how the NSE stock market's risk-reward dynamic works. The study used rolling regression techniques to examine portfolio performance from 2006 until 2023. The results demonstrated that beta does not reliably predict returns, particularly in times of economic uncertainty. The research found that market anomalies and behavioural

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biases make it possible that the conventional CAPM and Capital Market Line assumptions fail to adequately describe contemporary market behaviour.

2. **Artificial Intelligence, Information Environment, and Capital Market Efficiency**
   Author: Abdulazeez Y.H. Saif-Alyousfi
   Year: 2025

Abstract:
The impact of AI and data transparency on capital market efficiency was the focus of the article. The study indicated that AI increases market efficiency through better information transmission and stock price synchronisation, using data from Indian listed corporations from 2018 to 2023. New technologies improve investment decision-making and change the efficiency assumptions of asset pricing theories and the Capital Market Line, according to the study.

3. **Mapping the Research Landscape of Capital Structure and Financial Performance Through Bibliometric and Systematic Literature Review**
   Authors: Urwashi Soni and Biswajit Satpathy
   Year: 2025

Abstract:
The purpose of this study was to systematically examine the literature on the topic of capital structure and financial performance in various nations and industries. This study uncovered important research tendencies, theoretical voids, and funding tactics by utilising bibliometric analysis and PRISMA technique. Investment risk and corporate financing behaviour can be better understood with the use of capital market theories, such as the Capital Asset Pricing Model (CAPM) and the principles of portfolio management, as highlighted in the study.

4. **Systematic Literature Review of Applications of Data Science Techniques in the Domain of Indian Stock Markets**
   Authors: Sulekha Aloorravi and Vijayakumar Varadarajan
   Year: 2025

Abstract:
The research looked at how the Indian stock markets have used data science and machine learning. Investment possibilities and portfolio optimisation were the main points of discussion, with an emphasis on the role of financial models and predictive analytics. Computational methods are becoming more important in assessing investment efficiency, returns, and risk in the context of contemporary portfolio theory and the Capital Market Line, according to the study's authors.

5. **An In-Depth Understanding of Capital Market Theory: A Literature Review in the Context of Financial Management**
   Authors: Novita Chyndi Pratiwi, Dinasty Ratu Ayu Dyah Pytaloka, and Zainul Arifin
   Year: 2024

Abstract:
An examination of the literature on capital market theories and their function in the context of corporate finance management was provided in this review. Pricing theories, investment strategies, diversification of portfolios, and market efficiency were all covered in the article. Using frameworks like the Capital Asset Pricing Model (CAPM) and the Capital Market Line, the authors stressed, investors can better balance risk and return when making investments.

6. **Capital Structure and Firm Performance: A Study on Top 147 Non-Financial Companies in India**
   Author: Shubha Ranjan Dutta
   Year: 2024

Abstract:
Between 2010 and 2024, the research looked at firms listed on the NSE and how their capital structure affected their performance. The research indicated that leverage had a negative correlation with company profitability using panel regression and GMM models. By elucidating the ways in which financing decisions impact investor expectations and business valuation within asset pricing frameworks, the study made a valuable contribution to the capital market literature.

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7. **Asset-Pricing Models: A Case of Indian Capital Market**
   Author: Khurshid Khudoykulov
   Year: 2024

Abstract:
Using data from the Indian stock market, this research compared different asset-pricing models. To find out how well CAPM and alternative pricing techniques explained stock returns, the research put them to the test. Given the inefficiencies of the market and the fact that investor behaviour is always changing in emerging markets, the results indicated that multifactor models outperformed conventional CAPM.

8. **Stock Market Liquidity: A Literature Review**
   Authors: Priyanka Naik and Y. V. Reddy
   Year: 2023

Abstract:
The study compiled the results of important studies on liquidity in the stock market and organised them according to various liquidity metrics and factors. The effects of liquidity on asset pricing, portfolio returns, and market efficiency were detailed in the study. Also covered was the role of liquidity in shaping the Capital Market Line's shape and movement.

9. **Nonlinearity Between Economic Indicators and Indian Capital Market**
   Authors: Neeraj Nautiyal and Vinay Kandpal
   Year: 2023

Abstract:
The study used nonlinear ARDL techniques to examine the asymmetric link between the Indian stock market and macroeconomic variables. The results showed that interest rates, currency rates, oil prices, and gold prices all had a substantial impact on stock market returns. By detailing the effects of economic shocks on return and risk behaviour in the market, the article added to the body of knowledge on capital markets.

10. **Regret Theory and Asset Pricing Anomalies in Incomplete Markets with Dynamic Un-Aggregated Preferences**
    Author: Michael Nwogugu
    Year: 2023

Abstract:
Classical accounting principles and methods (CAPM, CML, and ICAPM) were the subjects of this paper's critical evaluation. The author stated that the Capital Market Line is not as accurate as it could be due to investor psychology and incomplete markets. Research suggested a new way to price assets and manage risks by combining regret theory with taxation, leisure, housing, and behavioural preferences.

Theoretical Framework

One of the cornerstones of William Sharpe's Capital Asset Pricing Model (CAPM) is the Capital Market Line (CML), which originated with Harry Markowitz's Modern Portfolio Theory (MPT). The correlation matrix (CML) illustrates the link between the standard deviation of a portfolio's overall risk and its projected return in an efficient investment strategy. It shows how a portfolio that includes a risk-free asset can outperform the market. Investors are rational, risk-averse, and want to maximise rewards with little risk, according to the notion.

Capital Market Line suggests that all investors diversify their holdings by owning both risk-free assets and market portfolios that include all market risk. By calculating the expected return relative to the level of risk, the CML proves that efficient portfolios are those that are lying on the line. Some investors may choose to put more of their money into risk-free assets, such as bonds, while others may be more daring and take out loans at the risk-free rate to put more money into the market, which would put them further along the Capital Market Line.

Diversification, first proposed by Modern Portfolio Theory, is integral to the CML's theoretical underpinnings. While Sharpe's capital asset pricing model (CAPM) proposed that a market portfolio is the ideal risky portfolio, Markowitz maintained that diversification can lower portfolio risk. The CML integrates these concepts and gives investors in a perfectly competitive capital market a visual depiction

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of the risk-return tradeoff. The capital market line's slope stands for the Sharpe Ratio, a measure of the excess return earned per unit of overall risk.

Capital Market Line presupposes a number of things, including that there is a risk-free lending and borrowing rate, that investors have identical expectations, that capital markets are flawless, that there are no taxes or transaction fees, and that investors can borrow and lend a limitless amount at this rate. The CML is still a useful theoretical framework for learning about risk management, investment decision-making, and portfolio building, even though these assumptions might not hold true in actual financial markets.

OBJECTIVES OF THE STUDY

- - To focus on the strategy of speculating and the risks and returns associated with it, as well as the rates of return for successful portfolios.
  The objectives are as follows:
- To identify the perfect portfolio that would provide the financial backer with an ideal return while keeping their risk to a minimum
- To determine if the risk associated with the portfolios is comparable to the individual risk that is used to build them
- To assess if the chosen portfolios are bringing the financial backer a satisfactory return
- To understand, analyse, and select the optimal portfolio

DATA ANALYSIS AND INTERPRETATION

RISK RETURN ANALYSIS ON TATA STEEL LIMITED

Date	OPEN	close	Returns	avg returns	difference	d*d
28-Mar-25	152.7	155.85	2.021174	-0.21943	2.2506	5.020286
27-Mar-25	152.45	152.7	0.16372	-0.21943	0.383145	0.1468
26-Mar-25	151.15	152.4	0.82021	-0.21943	1.039635	1.080842
22-Mar-25	149	151.8	1.844532	-0.21943	2.063958	4.259921
21-Mar-25	148	150.1	1.399067	-0.21943	1.618493	2.619518
20-Mar-25	149.6	145.65	-2.71198	-0.21943	-2.49256	6.212833
19-Mar-25	149	148.75	-0.16807	-0.21943	0.051358	0.002638
18-Mar-25	142.55	149.7	4.776219	-0.21943	4.995644	25.95646
15-Mar-25	142.9	141.7	-0.84686	-0.21943	-0.62743	0.393674
14-Mar-25	143.6	142.45	-0.8073	-0.21943	-0.58788	0.345598
13-Mar-25	152.8	143.65	-6.36965	-0.21943	-6.15022	37.82525
12-Mar-25	154.2	152.5	-1.11475	-0.21943	-0.89533	0.801614
11-Mar-25	158.9	153.45	-3.55165	-0.21943	-3.33222	11.10369
07-Mar-25	152.4	157.25	3.084261	-0.21943	3.303686	10.91434
06-Mar-25	151.8	151.6	-0.13193	-0.21943	0.087499	0.007656
05-Mar-25	153.2	151.85	-0.88904	-0.21943	-0.66961	0.448377
04-Mar-25	154.9	153.1	-1.1757	-0.21943	-0.95628	0.914465
02-Mar-25	152	155.25	2.093398	-0.21943	2.312823	5.349151
01-Mar-25	143	149.95	4.634878	-0.21943	4.854304	23.56426
29-Feb-25	140.8	140.85	0.035499	-0.21943	0.254925	0.064986
28-Feb-25	144.05	140.75	-2.34458	-0.21943	-2.12516	4.516293
27-Feb-25	142.65	144.2	1.074896	-0.21943	1.294321	1.675268
26-Feb-25	145.85	142.65	-2.25325	-0.21943	-2.02383	4.095877

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23-Feb-25	146.4	145.45	-0.65315	-0.21943	-0.43372	0.188113
22-Feb-25	145	145.9	0.616861	-0.21943	0.836286	0.699375
21-Feb-25	141.55	143.9	1.633079	-0.21943	1.852504	3.431771
20-Feb-25	141.95	141.05	-0.63807	-0.21943	-0.41865	0.175265
19-Feb-25	142.95	141.95	-0.70447	-0.21943	-0.48505	0.235272
16-Feb-25	142.05	142.3	0.175685	-0.21943	0.395111	0.156112
15-Feb-25	141.5	141.2	-0.21256	-0.21943	0.006961	4.85E-05
14-Feb-25	137	141.2	2.974504	-0.21943	3.19393	10.20119
13-Feb-25	137.75	137.85	0.072543	-0.21943	0.291968	0.085255
12-Feb-25	142	137.4	-3.34789	-0.21943	-3.12846	9.787287
09-Feb-25	144.2	141.3	-2.05237	-0.21943	-1.83295	3.359689
08-Feb-25	145.3	143.65	-1.14863	-0.21943	-0.9292	0.863412
07-Feb-25	146.85	144.4	-1.69668	-0.21943	-1.47725	2.182269
06-Feb-25	143	144.65	1.140684	-0.21943	1.36011	1.849899
05-Feb-25	140	141.55	1.095019	-0.21943	1.314445	1.727765
02-Feb-25	135.3	138.7	2.451334	-0.21943	2.670759	7.132954
01-Feb-25	136.4	134.8	-1.18694	-0.21943	-0.96752	0.936092
31-Jan-25	135	135.95	0.698786	-0.21943	0.918212	0.843113
30-Jan-25	135.6	134.7	-0.66815	-0.21943	-0.44873	0.201355
29-Jan-25	134.7	135	0.222222	-0.21943	0.441648	0.195053
25-Jan-25	136.5	133.75	-2.05607	-0.21943	-1.83665	3.373281
25-Jan-25	130.2	135.15	3.662597	-0.21943	3.882022	15.0701
23-Jan-25	134.8	130.1	-3.61261	-0.21943	-3.39318	11.51367
20-Jan-25	134.25	133.95	-0.22396	-0.21943	-0.00454	2.06E-05
19-Jan-25	132.6	134.25	1.22905	-0.21943	1.448476	2.098082
18-Jan-25	131.65	131	-0.49618	-0.21943	-0.27676	0.076595
17-Jan-25	135.45	131.65	-2.88644	-0.21943	-2.66702	7.112974
16-Jan-25	134.7	137.25	1.857923	-0.21943	2.077349	4.315378
15-Jan-25	136	134.9	-0.81542	-0.21943	-0.59599	0.355208
12-Jan-25	135.8	135.3	-0.36955	-0.21943	-0.15012	0.022537
11-Jan-25	134.85	134.9	0.037064	-0.21943	0.25649	0.065787
10-Jan-25	133.8	134.1	0.223714	-0.21943	0.443139	0.196372
09-Jan-25	133.5	133.65	0.112233	-0.21943	0.331659	0.109998
08-Jan-25	135.3	132	-2.5	-0.21943	-2.28057	5.201021
05-Jan-25	135	133.65	-1.0101	-0.21943	-0.79068	0.625168
04-Jan-25	136	134.25	-1.30354	-0.21943	-1.08411	1.175301
03-Jan-25	139.5	135.35	-3.06612	-0.21943	-2.8467	8.103698
02-Jan-25	140.5	139.6	-0.6447	-0.21943	-0.42527	0.180858
01-Jan-25	140	139.85	-0.10726	-0.21943	0.112168	0.012582
			-0.21943			250.1797

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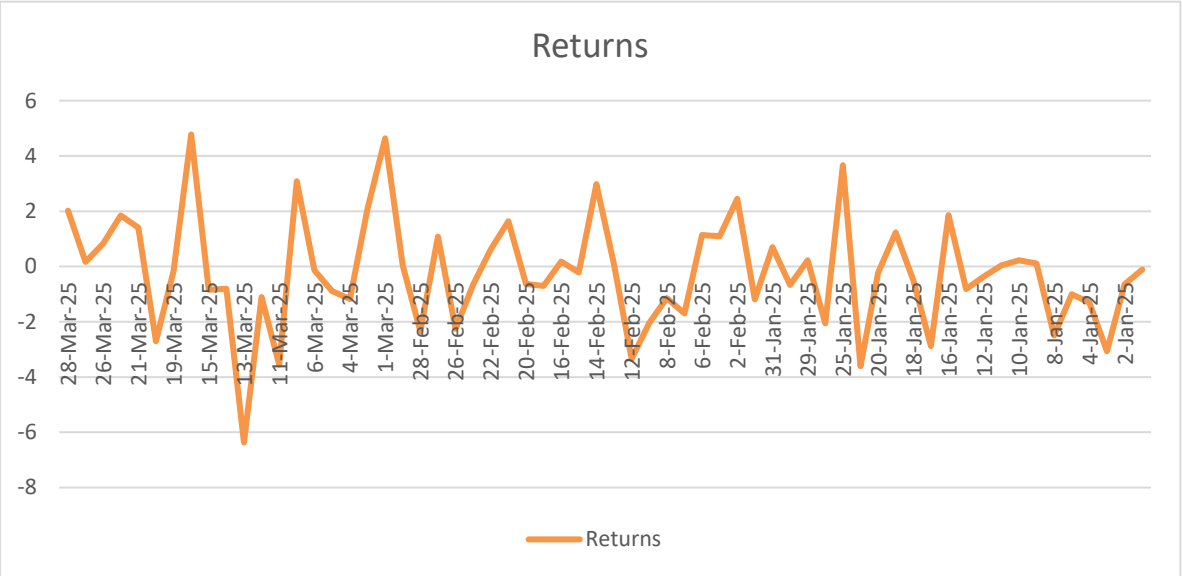
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Average returs =-0.21943
Variance= ∑D2/(n-1)
=4.101307
Risk(σ)= √variance
= 2.025168
Co-efficent of variance=Risk/ Average returs
=2.025168/-0.21943
=-9.22942

GRAPHICAL REPRESENTATION



Interpretation:

The following table shows the risk and return statistics for TATA steel limited over a three-month period (01-Jan-2025 to 31-Mar-25): -0.21943 for average returns, 4.101307 for variance, 2.025168 for risk, and -9.22942 for coefficient of variation.

On January 1, 25 the stock value of the corporation peaked at 157.25 and on March 19, 25 it dropped to 130.1.

FINDINGS

- The systematic risk of TATA steel in relation to Nifty is 1.77807, with average returns of -0.21943, variation of 4.101307, risk of 2.025168, and coefficient of variance of -9.22942. A return of 3.542399 is anticipated from the portfolio.
- The Bajaj auto has a systematic risk of 0.694419 compared to Nifty, an average return of -0.21943, a variance of 2.929658, a risk of 1.711625, and a coefficient of variance of 6.452784. The anticipated returns for the portfolio amount to 0.5264
- In terms of average returns, variance, risk, coefficient of variation, and systematic risk relative to nifty, the Bharat dynamics has a value of -0.47464, 10.33064, 3.214131, and -6.77178, respectively. 4.620461 is the predicted return on the portfolio.
- In terms of average returns, Tvs electronics has a value of -0.80935, a variance of 6.187025, a risk of 2.487373, a coefficient of variance of -3.07329, and a systematic risk of 1.605593 against nifty. 3.946858 is the estimated return on the portfolio.
- The Vaibhav global has a systematic risk of 2.307628 in relation to Nifty, an average return of -0.52175, a variance of 12.52914, a risk of 3.539652, and a coefficient of variance of -6.78426. 8.067952 is the estimated return on the portfolio.

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SUGGESTIONS

Of course, using the data you supplied, I have the following recommendations for each of the businesses:
About Tata Steel:
Investors should proceed with caution because to the extreme volatility and negative average return.
It would be wise to hold off on investing until the company shows more consistency in results, given the negative discrepancy between predicted and actual returns.
About Bajaj Auto:
The volatility is lower than other equities, even if the average return is negative.
Potential backers might keep a careful eye on the company's progress and think about putting money in once they see evidence of consistent returns.
The dynamics of Bharat
On average, Bharat Dynamics returns less than zero and is very volatile.
Before putting money into the company, investors should see if the returns are consistent.
Tech-Vision Systems:
Having high volatility and negative average returns, TVS Electronics is quite similar to Bharat Dynamics.
Wait for the company to show signs of increased performance before investing. Investors should be patient.

CONCLUSION

The companies presented have high volatility and negative average returns, therefore it's clear that investors should be cautious when considering their potential. Among the companies displaying unfavourable returns and substantial performance variations are Vaibhav Global, Tata Steel, Bajaj Auto, Bharat Dynamics, and TVS Electronics. This points to an unsteady and unreliable market in each of their areas. Investors should be patient and keep a careful eye on these companies for indications of improved performance before thinking about investing. Although the Capital Market Line suggests positive predicted returns, these companies' actual returns show a different reality, therefore it's important to be cautious and observe closely. To make a better-informed and maybe lucrative investment decision down the road, it would be prudent to wait for these companies to show regular and steady returns. This would reduce the risks connected with their current volatility character.

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