e-ISSN:2582-7219

INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH IN SCIENCE, ENGINEERING AND TECHNOLOGY

Volume 7, Issue 9, September 2024

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 7.521

© 2024 IJMRSET | Volume 7, Issue 9, September 2024| DOI:10.15680/IJMRSET.2024.0709049

ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 7.521| ESTD Year: 2018|

International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

Stock Valuation of Selected Automobile Sector Companies: A Capm-Based Empirical Analysis

A Jyosna Devi, Dr. S Nayamath Basha

Student, Department of MBA, CMR Technical Campus, Hyderabad, India

Associate Professor, Department of MBA, CMR Technical Campus, Hyderabad, India

ABSTRACT: Stock valuation plays a crucial role in investment decision-making, particularly in capital-intensive sectors such as automobiles. The present study examines the stock valuation of selected automobile sector companies in India using the Capital Asset Pricing Model (CAPM). The automobile industry significantly contributes to India's GDP and has witnessed substantial volatility due to changing economic conditions, technological innovations, and fluctuating demand patterns. This study employs secondary data sourced from stock exchange records, financial databases, and published reports to analyze risk and return characteristics of selected automobile stocks. Systematic risk is measured using beta coefficients, while expected returns are computed using the CAPM framework. The analysis aims to compare intrinsic returns with market expectations to identify relatively attractive investment opportunities. The findings of the study provide meaningful insights to investors regarding risk-adjusted returns and portfolio diversification within the automobile sector. The study concludes that CAPM remains a useful tool for evaluating stock performance despite certain limitations related to market assumptions and short-term data constraints.

KEYWORDS: Stock Valuation, Automobile Sector, CAPM, Risk and Return, Beta, Indian Stock Market

I. INTRODUCTION

Investment in equity markets requires a systematic evaluation of risk and return to ensure rational decision-making. Stock valuation helps investors determine whether a security is undervalued, overvalued, or fairly priced in the market. In the Indian context, the automobile sector occupies a strategic position due to its strong linkages with manufacturing, employment generation, and economic growth. The sector is highly sensitive to macroeconomic variables such as interest rates, fuel prices, technological advancements, and regulatory policies. The Capital Asset Pricing Model (CAPM) provides a theoretical framework to assess the expected return of a stock by incorporating systematic risk measured through beta. By linking risk with expected return, CAPM assists investors in understanding whether the returns offered by a stock adequately compensate for the risk undertaken. Applying CAPM to automobile sector stocks enables a comparative assessment of companies operating under similar industry conditions. This study focuses on the valuation of selected automobile sector companies in India using the CAPM approach. By analyzing historical stock prices and market movements, the study attempts to provide insights into the risk-return trade-off faced by investors and assist in informed portfolio construction.

II. LITERATURE REVIEW

Asthana, Ahmed, and Tiwari (2024) examined the limitations of the traditional CAPM by incorporating downside and upside risk measures using Bombay Stock Exchange data. The study demonstrated that modified CAPM models provided better explanatory power than the conventional beta-based approach. The findings suggested that asymmetric risk considerations improve stock valuation accuracy, particularly in volatile emerging markets like India (Asthana et al., 2024). **Balaji, Gujjar, and Shruthi (2024)** empirically tested the validity of CAPM using Nifty-500 index companies to assess the strength of the beta-return relationship. The results revealed a positive but weak association between systematic risk and returns, indicating limited support for CAPM assumptions. The study emphasized that Indian stock valuation practices should move beyond single-factor models to achieve better explanatory power (Balaji et al., 2024). **Nandan and Kushwaha (2024)** compared the effectiveness of the Capital Asset Pricing Model and Arbitrage Pricing Theory in estimating expected returns for Indian stocks. Using empirical testing, the study found that while CAPM offers a foundational valuation benchmark, multifactor models such as APT produced more reliable

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return estimates. The authors concluded that CAPM should be supplemented with additional factors to improve stock valuation outcomes (Nandan & Kushwaha, 2024).

Kumar (2023) evaluated the performance of CAPM in the Indian stock market using time-series analysis of NSE-listed companies. The findings confirmed that beta remains a relevant indicator of market risk but is insufficient as a standalone determinant of stock returns. The study concluded that CAPM can serve as a baseline valuation model but requires integration with other analytical tools for improved accuracy (Kumar, 2023). **Praveen Kumar, Unnikrishnan, and Ananth (2023)** analyzed stock valuation using the CAPM framework for Nifty-50 companies. The study compared expected returns generated by CAPM with actual market returns and found significant deviations for several stocks. These discrepancies indicated the presence of market anomalies and informational inefficiencies. The authors concluded that although CAPM remains conceptually relevant, its practical effectiveness in the Indian market is constrained by external economic and firm-specific factors (Praveen Kumar et al., 2023). **Chauhan and Rajani (2023)** conducted a sector-specific empirical study applying CAPM to selected automobile companies listed on the NSE. The study evaluated whether systematic risk adequately explained stock returns within the automobile industry. The results indicated inconsistent beta-return relationships, suggesting inefficiencies in valuation when CAPM is applied in isolation. The authors highlighted the need for incorporating additional financial and macroeconomic variables to enhance valuation accuracy in the automobile sector (Chauhan & Rajani, 2023). **Talwar and Gopinathan (2022)** empirically tested the Capital Asset Pricing Model using selected companies listed on the National Stock Exchange. By examining beta-return relationships across firms, the study identified statistically significant results for some stocks, while others exhibited weak or insignificant relationships. The findings suggested that CAPM can offer partial insights into stock valuation but lacks comprehensive explanatory power in a diverse and evolving market such as India (Talwar & Gopinathan, 2022).

Suraj, Antony, and Nitha (2020) investigated whether CAPM continues to remain relevant for Sensex stocks by applying regression-based analysis. The study revealed mixed results, where CAPM successfully explained returns for certain large-capitalization stocks but failed for others. This inconsistency suggested that CAPM's applicability varies across firms and market conditions. The authors concluded that CAPM may be conditionally useful but should not be relied upon as a universal valuation model in the Indian equity market (Suraj et al., 2020). **Anwar and Kumar (2018)** examined the empirical validity of CAPM in the Indian stock market by analyzing the relationship between systematic risk and expected returns. Using portfolio-level data, the study found a positive but weak association between beta and returns, indicating limited support for CAPM assumptions. The authors argued that market inefficiencies and structural factors in emerging economies reduce the effectiveness of single-factor asset pricing models for accurate stock valuation (Anwar & Kumar, 2018). **Aggarwal (2017)** compared the explanatory power of the traditional Capital Asset Pricing Model with the Fama–French three-factor model using Indian stock market data. The study employed regression analysis to assess how well each model explained stock return variability. The findings showed that the three-factor model significantly outperformed CAPM, highlighting the limitations of relying solely on beta for valuation purposes. The study concluded that Indian equity markets exhibit size and value effects that weaken the predictive strength of CAPM (Aggarwal, 2017). **Panwar (2016)** empirically tested the validity of the Capital Asset Pricing Model using Sensex-listed companies over a defined study period. By examining the relationship between beta and stock returns, the study aimed to verify whether systematic risk adequately explains return variations. The results demonstrated that beta failed to consistently predict stock returns, thereby rejecting the core assumptions of CAPM in the Indian market context. The study emphasized that stock valuation models in India must incorporate additional risk factors beyond market risk to improve predictive accuracy (Panwar, 2016). **Agarwal and Mangla (2014)** conducted an empirical investigation into the practical applicability of the Capital Asset Pricing Model (CAPM) by analyzing selected automobile sector companies listed under the CNX Auto Index on the National Stock Exchange. The study estimated expected returns using beta as a measure of systematic risk and compared them with actual market returns. The findings revealed notable deviations between expected and realized returns for several automobile companies, indicating that CAPM does not fully capture valuation dynamics in the Indian automobile sector. The authors concluded that while CAPM provides a theoretical foundation for stock valuation, its practical relevance in sector-specific analysis remains limited in emerging markets like India (Agarwal & Mangla, 2014).

© 2024 IJMRSET | Volume 7, Issue 9, September 2024| DOI:10.15680/IJMRSET.2024.0709049

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III. RESEARCH OBJECTIVES

This research paper has following research objectives.

- To calculate the risk and return profiles of selected automobile sector stocks
- To measure the systematic risk associated with each selected equity
- To compute expected returns using the Capital Asset Pricing Model
- To provide investment insights based on risk-adjusted performance

RESEARCH HYPOTHESES

The null hypotheses that will be tested in this research paper are given below.

- H_1: There is a significant relationship between systematic risk (beta) and expected returns of automobile sector stocks
- H_2: CAPM effectively explains the risk-return behavior of selected automobile sector stocks
- H_3: Automobile sector stocks offer varying risk-adjusted returns to investors

IV. RESEARCH METHODOLOGY

The various components of research methodology adopted in this research paper are as follows. The study is based on secondary data collected from reliable sources such as the National Stock Exchange (NSE), Bombay Stock Exchange (BSE), financial websites, journals, and published reports. The study period covers three months from January 2024 to March 2024. Selected automobile sector companies are analyzed to estimate returns, variance, standard deviation, and beta. The CAPM formula is applied using the risk-free rate, market return, and beta to compute expected returns. Statistical tools such as mean, variance, and coefficient of variation are employed to interpret stock performance and investment risk, strictly following the methodology outlined in the attached document

V. RESULTS AND DISCUSSION

The data that is collected to carry out this research is analyzed by using appropriate statistical tools and the following results are obtained. The data analysis and interpretation is given in the following section.

Table 1: Summary of Risk and Return Profiles of Selected Automobile Stocks

Company Name	Average Return (%)	Variance	Standard Deviation (Risk)	Coefficient of Variation
Bajaj Auto Ltd	0.2653	2.9297	1.7116	6.4516
Maruti Suzuki India Ltd	0.3249	1.8459	1.3587	4.1819
Samvardhana Motherson Intl. Ltd	-0.2614	4.372	2.0909	-7.999
Eicher Motors Ltd	-0.2324	2.2577	1.5026	-6.4647
CEAT Ltd	-0.1047	6.2022	2.4904	-23.7809
Tata Motors Ltd	-0.1295	2.8407	1.6855	-13.0135

(Source: Results after data analysis)

The analysis of Table 1 reveals clear variations in the risk–return characteristics of the selected automobile sector stocks. Maruti Suzuki India Ltd recorded the highest average return (0.3249%) with the lowest standard deviation (1.3587), indicating superior stability and efficient risk management during the study period. Bajaj Auto Ltd also generated a positive average return (0.2653%) with moderate risk, reflecting a balanced risk–return profile. In contrast, Samvardhana Motherson International Ltd, Eicher Motors Ltd, CEAT Ltd, and Tata Motors Ltd reported negative average returns, suggesting that these stocks did not compensate investors adequately for the risks undertaken. CEAT Ltd exhibited the highest variance (6.2022) and standard deviation (2.4904), highlighting excessive volatility and an

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unfavorable coefficient of variation, which reflects poor risk-adjusted performance. Tata Motors Ltd showed moderate risk but negative returns, indicating inefficient utilization of risk during the study period.

Table 2: Comparative Analysis of Systematic Risk (Volatility Perspective)

Company Name	Risk Level (Std. Deviation)	Volatility Category
Bajaj Auto Ltd	1.7116	Moderate
Maruti Suzuki India Ltd	1.3587	Low
Samvardhana Motherson Intl. Ltd	2.0909	High
Eicher Motors Ltd	1.5026	Moderate
CEAT Ltd	2.4904	Very High
Tata Motors Ltd	1.6855	Moderate

(Source: Results after data analysis)

The volatility perspective presented in Table 2 supports the findings of Table 1. Maruti Suzuki India Ltd falls into the low volatility category, confirming its defensive nature and suitability for risk-averse investors. Bajaj Auto Ltd, Eicher Motors Ltd, and Tata Motors Ltd are categorized under moderate volatility, implying manageable but noticeable exposure to market fluctuations. Samvardhana Motherson International Ltd and CEAT Ltd fall under high and very high volatility categories, respectively, indicating greater sensitivity to market movements and higher systematic risk.

Table 3: Risk–Return Ranking of Selected Automobile Stocks

Rank	Company Name	Average Return	Risk	Risk-Adjusted Performance
1	Maruti Suzuki India Ltd	High	Low	Best
2	Bajaj Auto Ltd	Moderate	Moderate	Good
3	Eicher Motors Ltd	Negative	Moderate	Average
4	Samvardhana Motherson Intl. Ltd	Negative	High	Weak
5	CEAT Ltd	Negative	Very High	Poor
6	Tata Motors Ltd	Negative	High	Weak

(Source: Results after data analysis)

Table 3 provides a consolidated risk–return ranking, which clearly positions Maruti Suzuki India Ltd as the best-performing stock due to its high returns and low risk. Bajaj Auto Ltd ranks second, offering a good balance between return and volatility. Eicher Motors Ltd occupies a middle position with moderate risk but negative returns, resulting in average performance. Samvardhana Motherson International Ltd and Tata Motors Ltd display weak risk-adjusted performance due to high risk and negative returns, while CEAT Ltd ranks last owing to its very high volatility and poor return performance.

Table 4: CAPM Expected Returns of Selected Automobile Sector Stocks

Company Name	Beta (β)	Risk-Free Rate (Rf %)	Market Return (Rm %)	Market Risk Premium (%)	CAPM Expected Return (%)
Bajaj Auto Ltd	1.12	7	12	5	12.6
Maruti Suzuki India Ltd	0.85	7	12	5	11.25

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Samvardhana Motherson Intl. Ltd	1.35	7	12	5	13.75
Eicher Motors Ltd	1.1	7	12	5	12.5
CEAT Ltd	1.48	7	12	5	14.4
Tata Motors Ltd	1.3	7	12	5	13.5

(Source: Results after data analysis)

The CAPM-based expected returns in Table 4 indicate that stocks with higher beta values command higher expected returns. CEAT Ltd (β = 1.48) and Samvardhana Motherson International Ltd (β = 1.35) show the highest expected returns of 14.4% and 13.75%, respectively, reflecting higher systematic risk. Maruti Suzuki India Ltd, with the lowest beta (0.85), records the lowest expected return (11.25%), consistent with its low-risk profile. However, when CAPM expected returns are compared with actual average returns, it is evident that several high-beta stocks failed to deliver returns in line with CAPM expectations during the study period, underscoring the importance of empirical performance analysis alongside theoretical models.

VI. FINDINGS OF THE RESEARCH PAPER

After analyzing the data collected, this research paper found the following.

- Maruti Suzuki India Ltd demonstrated the most favorable risk–return profile by generating the highest average return with the lowest volatility, making it the most stable stock among the selected automobile companies.
- Bajaj Auto Ltd exhibited a balanced performance with moderate risk and positive returns, indicating reliable investment potential during the study period.
- CEAT Ltd showed the highest volatility and the poorest coefficient of variation, highlighting excessive risk exposure without corresponding returns.
- Samvardhana Motherson International Ltd and Tata Motors Ltd recorded negative returns combined with high to moderate risk, resulting in weak risk-adjusted performance.
- The volatility categorization confirms that lower-risk stocks outperformed high-risk stocks in terms of realized returns during the selected period.
- CAPM results indicate higher expected returns for high-beta stocks, but actual returns did not align with theoretical expectations for several companies.

VII. RECOMMENDATIONS OF THE RESEARCH PAPER

On the basis of the findings that are mentioned in the above section, this research paper makes the following recommendations.

- Investors with low risk tolerance should prefer Maruti Suzuki India Ltd due to its low volatility and consistent return performance.
- Bajaj Auto Ltd can be considered by investors seeking moderate growth with controlled risk exposure.
- High-volatility stocks such as CEAT Ltd and Samvardhana Motherson International Ltd should be approached cautiously and may be suitable only for aggressive investors with a long-term horizon.
- Tata Motors Ltd and Eicher Motors Ltd require careful monitoring, as moderate risk levels have not translated into positive returns during the study period.
- Investors should combine CAPM estimates with actual risk–return analysis before making investment decisions rather than relying solely on theoretical models.
- Portfolio diversification across low and moderate-risk automobile stocks is recommended to minimize overall investment risk.

VIII. CONCLUSION

The study concludes that the risk–return performance of automobile sector stocks varies significantly across companies. Stocks with lower volatility, particularly Maruti Suzuki India Ltd, delivered superior and more stable returns, validating

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the importance of risk management in equity investment. While CAPM suggests higher expected returns for high-beta stocks, empirical evidence from the study period indicates that higher risk did not always result in higher realized returns. Therefore, investors should not rely exclusively on theoretical models but should integrate systematic risk measures with actual performance indicators. Overall, a prudent investment strategy emphasizing low to moderate-risk stocks and effective diversification is essential for achieving optimal returns in the automobile sector.

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