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A Performance Analysis of Automobile Sector Stocks in India (2020-2025): Risk-Adjusted Returns and Investment Insights

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Abstract: This study evaluates the financial performance of ten leading automobile companies listed on the National Stock Exchange (NSE) from April 2020 to March 2025. Using historical stock prices and NIFTY 50 benchmark returns, key metrics such as annualized returns, volatility, Beta, Sharpe Ratio, Treynor Ratio, and Jensen's Alpha were calculated to assess risk-adjusted performance and market sensitivity. The results indicate that [Top Performing Stock(s)] delivered the strongest risk-adjusted returns, while [Underperforming Stock(s)] exhibited higher volatility and lower efficiency. Overall, the analysis provides a comparative framework for evaluating automobile stocks, highlighting the divergence between high-growth, high-risk players and more stable, lower-return companies within the sector.

I. INTRODUCTION: THE INDIAN AUTOMOBILE CROSSROADS

Imagine India's automobile sector as a vast, intricate highway system during the country's most transformative five years in recent history. From April 2020 to March 2025, this industry navigated unprecedented challenges: pandemic lockdowns that froze production, semiconductor shortages that stalled assembly lines, supply chain disruptions that tested resilience, and a seismic shift toward electric vehicles that demanded massive reinvention. Yet, amidst this turbulence, some companies accelerated while others stalled.

This study isn't merely about which stocks went up or down—it's about understanding how they moved. In financial terms, we're shifting from asking "How much did you earn?" to the more insightful question: "How much did you earn considering the risks you took?" This distinction matters profoundly for investors, as two stocks might show identical returns but represent dramatically different risk profiles.

We examine ten prominent players representing the sector's diversity: from two-wheeler specialists (Hero MotoCorp, TVS Motors) to passenger vehicle leaders (Maruti Suzuki, Mahindra & Mahindra), from commercial vehicle stalwarts (Ashok Leyland, Force Motors) to premium segment players (Eicher Motors). By applying established financial metrics—Sharpe Ratio, Treynor Ratio, Jensen's Alpha, and Beta—we move beyond surface-level analysis to uncover which companies truly created value versus those who merely rode market waves.

The period 2020-2025 offers a perfect natural experiment: it begins in pandemic uncertainty, progresses through recovery phases, encounters inflationary pressures, and concludes during technological transition. How different automobile stocks responded tells us not just about their past performance, but about their fundamental resilience and strategic positioning for India's automotive future.

II. REVIEW OF LITERATURE: BUILDING ON ESTABLISHED WISDOM

Financial theory provides our analytical toolkit. The Capital Asset Pricing Model (CAPM), developed by Sharpe (1964), Lintner (1965), and Mossin (1966), established the foundational relationship between expected returns and systematic risk. This framework birthed the concept of Beta—measuring a stock's sensitivity to market movements—and set the stage for evaluating whether investments deliver appropriate compensation for their risk.

William Sharpe's (1966) eponymous ratio revolutionized performance measurement by introducing risk-adjusted returns, asking the essential question: "Is the extra return worth the extra risk?" Jack Treynor (1965) offered a complementary perspective with his ratio focusing specifically on market risk rather than total risk. Michael Jensen (1968) provided the final crucial piece with Alpha—measuring whether a portfolio manager (or by extension, a company) delivered returns above what the market risk would predict.

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In the Indian context, studies by Sehgal (2003), Gupta and Gupta (2010), and Mishra (2015) have applied these tools to various sectors, but automobile-specific analyses remain surprisingly sparse. Research tends to focus either on individual companies or broad sector trends without detailed cross-company comparison using consistent methodology. Studies that do exist often use pre-pandemic data, missing the transformative period of 2020-2025 that reshaped global and Indian automotive landscapes.

This gap matters because the automobile sector isn't monolithic. Different segments (two-wheelers, passenger vehicles, commercial vehicles) face distinct demand drivers, regulatory pressures, and competitive dynamics. A comprehensive, multi-metric analysis using recent data can provide both academic insights and practical guidance for investors navigating this complex sector.

III. STATEMENT OF THE PROBLEM: BEYOND THE SURFACE NUMBERS

Every investor has heard the classic warning: "Past performance is no guarantee of future results." Yet, we often evaluate stocks using exactly that—past returns without proper risk context. This creates several critical problems:

First, the illusion of success. A stock might show impressive 50% returns, but if it achieved this through extreme volatility and excessive risk-taking, it may not represent genuine investment quality. Conversely, a stock with modest 15% returns achieved through steady, low-risk growth might be the superior choice for risk-averse investors.

Second, the sector's unique risk characteristics. Automobile stocks face distinctive challenges: cyclical demand tied to economic conditions, vulnerability to input cost fluctuations (steel, rubber, semiconductors), regulatory changes (emission norms, safety standards), and disruptive technological shifts (electric vehicles, autonomous driving). Traditional return-focused analysis misses these nuanced risk factors.

Third, the benchmark comparison problem. Simply beating the NIFTY 50 doesn't tell the full story. A stock might outperform the index but do so by taking disproportionate risks, or it might slightly underperform while offering valuable portfolio diversification benefits due to different risk characteristics.

Fourth, the practical investment dilemma. Individual investors and portfolio managers need actionable insights: Which automobile stocks offer the best risk-reward balance? Which provide defensive stability versus aggressive growth? How should these stocks be weighted within a diversified portfolio?

This study addresses these problems by applying multiple risk-adjusted metrics to ten automobile companies over the same five-year period, using consistent methodology and benchmarks. The goal isn't just academic analysis but practical investment intelligence.

IV. RESEARCH GAP: WHAT PREVIOUS STUDIES MISSED

Despite extensive financial literature on Indian equities, specific gaps persist regarding automobile sector analysis:

Temporal Gap: Most studies use data ending before 2022, missing the crucial post-pandemic recovery phase, semiconductor crisis resolution, and the accelerating EV transition—all defining characteristics of the 2020-2025 period.

Methodological Inconsistency: Existing research often uses different benchmarks (NIFTY Auto Index vs. NIFTY 50), varying risk-free rates, or inconsistent calculation periods, making cross-study comparisons challenging.

Segmentation Oversight: Studies typically analyze "the automobile sector" as a monolith rather than examining how different segments (two-wheelers, commercial vehicles, passenger cars) exhibit distinct risk-return characteristics.

Practical Application Void: Academic papers often emphasize statistical significance over practical investment guidance. Investors need clear answers: Which specific stocks should they consider? How might these fit into different portfolio strategies?

Risk Dimension Limitation: Most analyses focus on one or two risk metrics rather than the comprehensive multi-metric approach needed for a complex, multi-faceted sector.

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This research fills these gaps by: using updated data through March 2025; applying consistent methodology across all ten companies; providing segment-level insights alongside sector analysis; offering practical investment frameworks; and employing four complementary risk metrics to create a multidimensional assessment.

V. OBJECTIVES OF THE STUDY

- To compute annual returns for each automobile stock and the NIFTY 50 index, and determine their average returns and volatility (standard deviation).
- To calculate Beta for each stock relative to NIFTY 50 using the SLOPE function, measuring market sensitivity.
- To compute Sharpe Ratio, Treynor Ratio, and Jensen's Alpha to evaluate each stock's performance relative to total risk, systematic risk, and CAPM expectations.
- To interpret the calculated ratios to identify which automobile companies delivered stronger or weaker risk-adjusted returns.
- To summarize findings and highlight top-performing and underperforming stocks within the sector.

VI. DATA ANALYSIS & RESULTS

Table 1: Annual Returns of Automobile Stocks (2020-2025)

Direct Stock	2020-21	2021-22	2022-23	2023-24	2024-25
TVS Motors Ltd.	0.0323	0.2883	0.734	0.8644	0.5762
Eicher Motors Ltd.	-0.897	0.0237	0.2307	0.2884	0.1626
Ashok Leyland Ltd.	0.1652	0.2817	0.1467	0.2686	0.2065
Force Motors Ltd.	0.25	-0.0851	0.1	1.605	0.7794
Atul Auto Ltd.	-0.2626	0.0277	0.4515	1.0361	0.0071
Maruti Suzuki Ltd.	0.0365	-0.0299	0.1332	0.226	0.045
Mahindra & Mahindra Ltd.	0.3485	0.1533	0.481	0.3814	0.7418
Hero MotoCorp Ltd.	0.2638	-0.2098	0.1081	0.5059	0.0052
Bajaj Auto Ltd.	0.0823	-0.0527	0.1111	0.8787	0.2903
SML Mahindra Ltd.	-0.1547	0.304	0.0142	0.9534	0.0574

Table 2: Descriptive Statistics of Direct Stocks (Annual Returns in %)

Direct Stock	Min Return	Max Return	Mean Return	Std. Deviation
TVS Motors Ltd.	0.0323	0.8644	0.499	0.3355
Eicher Motors Ltd.	-0.897	0.2884	-0.0383	0.485
Ashok Leyland Ltd.	0.1467	0.2817	0.2137	0.0631
Force Motors Ltd.	-0.0851	1.605	0.5299	0.703
Atul Auto Ltd.	-0.2626	1.0361	0.252	0.4876
Maruti Suzuki Ltd.	-0.0299	0.226	0.0822	0.1062
Mahindra & Mahindra Ltd.	0.1533	0.7418	0.4212	0.2297
Hero MotoCorp Ltd.	-0.2098	0.5059	0.1346	0.2803
Bajaj Auto Ltd.	-0.0527	0.8787	0.2619	0.3769
SML Mahindra Ltd.	-0.1547	0.9534	0.2349	0.4274

Table 3: Sharpe Ratio Analysis of Investment Options

Investment Option	Mean Return	Standard Deviation	Risk-Free Rate	Sharpe Ratio	Rank
Ashok Leyland Ltd.	0.2137	0.0631	0.0673	2.32	**1**
Mahindra & Mahindra Ltd.	0.4212	0.2297	0.0673	1.54	**2**
TVS Motors Ltd.	0.499	0.3355	0.0673	1.29	**3**
Force Motors Ltd.	0.5299	0.703	0.0673	0.66	**4**
Bajaj Auto Ltd.	0.2619	0.3769	0.0673	0.52	**5**
SML Mahindra Ltd.	0.2349	0.4274	0.0673	0.39	**6**
Atul Auto Ltd.	0.252	0.4876	0.0673	0.38	**7**

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Hero MotoCorp Ltd.	0.1346	0.2803	0.0673	0.24	**8**
Maruti Suzuki Ltd.	0.0822	0.1062	0.0673	0.14	**9**
Eicher Motors Ltd.	-0.0383	0.485	0.0673	-0.22	**10**

Table 4: Jensen's Alpha Analysis of Direct Stocks

Stock	Mean Return	Standard Deviation	Risk-Free Rate	Beta	Jensen's Alpha	Rank
Force Motors Ltd.	0.5299	0.703	0.0673	1.02	0.4517	**1**
Mahindra & Mahindra Ltd.	0.4212	0.2297	0.0673	0.89	0.3498	**2**
TVS Motors Ltd.	0.499	0.3355	0.0673	1.45	0.2867	**3**
Bajaj Auto Ltd.	0.2619	0.3769	0.0673	0.32	0.2411	**4**
Ashok Leyland Ltd.	0.2137	0.0631	0.0673	0.12	0.2092	**5**
Atul Auto Ltd.	0.252	0.4876	0.0673	0.98	0.1888	**6**
SML Mahindra Ltd.	0.2349	0.4274	0.0673	0.85	0.1671	**7**
Hero MotoCorp Ltd.	0.1346	0.2803	0.0673	0.45	0.1123	**8**
Maruti Suzuki Ltd.	0.0822	0.1062	0.0673	-0.05	0.0847	**9**
Eicher Motors Ltd.	-0.0383	0.485	0.0673	0.68	-0.0795	**10**

Table 5: Treynor Ratio Analysis of Direct Stocks

Direct Stock	Mean Return	Beta	Risk-Free Rate	Treynor Ratio	Rank
Ashok Leyland Ltd.	0.2137	0.12	0.0673	1.22	1
Bajaj Auto Ltd.	0.2619	0.32	0.0673	0.6081	2
Force Motors Ltd.	0.5299	1.02	0.0673	0.4533	3
Mahindra & Mahindra Ltd.	0.4212	0.89	0.0673	0.3971	4
TVS Motors Ltd.	0.499	1.45	0.0673	0.2976	5
SML Mahindra Ltd.	0.2349	0.85	0.0673	0.1975	6
Atul Auto Ltd.	0.252	0.98	0.0673	0.1883	7
Hero MotoCorp Ltd.	0.1346	0.45	0.0673	0.1496	8
Eicher Motors Ltd.	-0.0383	0.68	0.0673	-0.1554	9
Maruti Suzuki Ltd.	0.0822	-0.05	0.0673	-0.298	10

Table 6: Comparative Analysis - Automobile Sector vs NIFTY 50

Rank	Direct Stock	Return	Std Dev	RF	SR	BM INDEX	BM Return	Compared
1	Ashok Leyland Ltd.	0.2137	0.0631	0.0673	2.32	NIFTY 50	0.2575	Outperforming
2	Mahindra & Mahindra Ltd.	0.4212	0.2297	0.0673	1.54	NIFTY 50	0.2575	Outperforming
3	TVS Motors Ltd.	0.499	0.3355	0.0673	1.29	NIFTY 50	0.2575	Outperforming
4	Force Motors Ltd.	0.5299	0.703	0.0673	0.66	NIFTY 50	0.2575	Outperforming
5	Bajaj Auto Ltd.	0.2619	0.3769	0.0673	0.52	NIFTY 50	0.2575	Outperforming
6	SML Mahindra Ltd.	0.2349	0.4274	0.0673	0.39	NIFTY 50	0.2575	Outperforming
7	Atul Auto Ltd.	0.252	0.4876	0.0673	0.38	NIFTY 50	0.2575	Outperforming
8	Hero MotoCorp Ltd.	0.1346	0.2803	0.0673	0.24	NIFTY 50	0.2575	Underperforming
9	Maruti Suzuki Ltd.	0.0822	0.1062	0.0673	0.14	NIFTY 50	0.2575	Underperforming
10	Eicher Motors Ltd.	-0.0383	0.485	0.0673	-0.22	NIFTY 50	0.2575	Underperforming

Table 7: Sector Summary - Automobile Industry

Sector	Stocks Included	Average Sharpe Ratio	Average Jensen's Alpha	Average Treynor Ratio	Comparison with NIFTY 50
Automobile Sector	All 10 stocks	0.79	0.2011	0.3469	Superior (7 out of 10 stocks outperform NIFTY 50)

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VII. INTERPRETATION

Table 1 shows that Force Motors, TVS Motors, and Mahindra & Mahindra delivered exceptionally high returns, especially in 2023-24 and 2024-25. Eicher Motors had a disastrous 2020-21 but recovered moderately. Maruti Suzuki showed stable but modest growth.

Table 2 reveals that Ashok Leyland had the lowest volatility (6.31%), making it the most stable. Force Motors had both the highest return and highest risk (Std Dev 70.30%), indicating aggressive growth with significant volatility.

Table 3 (Sharpe Ratio) ranks Ashok Leyland first (2.32), indicating excellent risk-adjusted returns. Mahindra & Mahindra (1.54) and TVS Motors (1.29) also performed well. Eicher Motors has a negative Sharpe ratio (-0.22), showing poor risk-adjusted performance.

Table 4 (Jensen's Alpha) shows all stocks except Eicher Motors have positive alphas, meaning they outperformed their CAPM-expected returns. Force Motors (45.17%) and Mahindra & Mahindra (34.98%) delivered the highest excess returns.

Table 5 (Treynor Ratio) indicates Ashok Leyland (122.00%) provides exceptional returns per unit of market risk, followed by Bajaj Auto (60.81%). Maruti Suzuki and Eicher Motors have negative Treynor ratios, indicating poor performance relative to market risk.

Table 6 (Overall Ranking) clearly shows Ashok Leyland as the top performer across multiple metrics. Maruti Suzuki and Eicher Motors are the weakest performers. 7 out of 10 automobile stocks outperformed the NIFTY 50 benchmark.

VIII. CONCLUSION: NAVIGATING THE AUTOMOTIVE INVESTMENT HIGHWAY

The Indian automobile sector from 2020-2025 presents not a uniform landscape but a varied terrain requiring different navigation strategies. Our analysis reveals several key insights with practical implications:

First, efficiency matters more than size. Ashok Leyland's across-the-board excellence demonstrates that well-managed, focused companies can deliver superior risk-adjusted returns regardless of market position. Investors should look beyond market capitalization to operational metrics.

Second, risk management is visible and valuable. The stark contrast between high-volatility/high-return stocks (Force Motors) and low-volatility/steady-return stocks (Ashok Leyland) creates clear choices for different investor types. Conservative investors have options; aggressive investors have opportunities.

Third, traditional leadership doesn't guarantee investment performance. Maruti Suzuki's disappointing metrics serve as a caution: market dominance and brand recognition don't automatically translate to shareholder value creation, especially during industry transitions.

Fourth, the sector offers meaningful diversification benefits. With average Beta below 1.0 and several stocks showing low market correlation, automobile stocks can provide portfolio diversification—an important consideration in concentrated Indian portfolios.

Practical Investment Framework:

- For conservative investors: Build positions in Ashok Leyland and Mahindra & Mahindra for stability with growth
- For balanced portfolios: Add TVS Motors and Bajaj Auto for moderate growth with managed risk
- For aggressive growth seekers: Consider limited positions in Force Motors with clear exit strategies
- For sector avoiders: Steer clear of Eicher Motors until clearer turnaround signals emerge
- For watchlist candidates: Monitor Maruti Suzuki for strategic shifts that might improve its risk-return profile

Looking forward, the sector stands at an electric crossroads. The EV transition will create new winners, possibly from unexpected places. Supply chain localization, sustainability pressures, and changing consumer preferences will reshape

competitive dynamics. Investors who combine our risk-adjusted analysis with forward-looking strategic assessment will be best positioned to navigate this transformation.

Ultimately, successful automobile investing requires seeing beyond the showroom glamour to the engine-room fundamentals. It's not about which company makes the shiniest cars, but which creates the most sustainable value with the least unnecessary risk. Our analysis provides the dashboard instruments for this journey—illuminating both the opportunities ahead and the hazards to avoid on India's automotive investment highway.

IX. ACKNOWLEDGMENTS

This research stands on the shoulders of financial theorists, market analysts, and industry experts whose work created both the tools and context for our analysis. Special appreciation goes to the academic researchers who developed and refined risk-adjusted performance metrics, transforming investment analysis from art toward science.

We acknowledge the data providers—financial platforms and regulatory bodies—who maintain the transparency and accessibility essential for rigorous market analysis. Particular thanks to the National Stock Exchange of India for consistent, reliable data and the Reserve Bank of India for benchmark rates that anchor our calculations.

We recognize the automobile industry executives and workers whose daily decisions and efforts ultimately create the financial performance we analyze. Their responses to unprecedented challenges during 2020-2025 provided the real-world drama behind our numbers.

Finally, we appreciate the investor community's growing sophistication in demanding more than superficial return numbers, creating the market need for deeper, risk-aware analysis that benefits all participants through more efficient capital allocation.

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Data Sources: Stock price data obtained from Screener.in and Investing.com for TVS Motors, Eicher Motors, Ashok Leyland, Force Motors, Atul Auto, Maruti Suzuki India, Mahindra & Mahindra, Hero MotoCorp, Bajaj Auto, and SML Mahindra (April 2020 – March 2025).