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## **Risk and Return Analysis of Top 5 Mid-Cap Pharmaceutical Companies in India of NSE**

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DOI : <https://doi.org/10.55248/gengpi.5.1024.2744>

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### **ABSTRACT**

The Indian pharmaceutical sector plays a crucial role in the nation's economy, contributing significantly to healthcare advancement and drug manufacturing. Mid-cap pharmaceutical companies, in particular, present a promising investment opportunity due to their potential for growth. However, these firms also carry higher risks, including regulatory challenges, market competition, and financial volatility. This study focuses on evaluating the risk-return profiles of the top five mid-cap pharmaceutical companies in India listed on the NSE: Aurobindo Pharma, Glenmark Pharmaceuticals, Alkem Laboratories, Lupin Ltd., and Divi's Laboratories. The research aims to address the increasing need to understand whether the returns offered by these companies are sufficient to justify the associated risks for investors and portfolio managers. The primary objectives include analyzing historical returns, calculating financial metrics like beta and standard deviation, and providing investment recommendations based on the findings. A quantitative and descriptive research approach was employed, utilizing data from financial platforms and statistical tools to assess the companies' performance over a specified period. The results indicate that while all five companies outperformed the NSE, they exhibited higher volatility. Glenmark Pharmaceuticals led in absolute returns but showed significant volatility, while Divi's Laboratories demonstrated stability with lower risk, appealing to risk-averse investors. The outcomes provide critical insights into the trade-offs between risk and return, aiding investors in making informed decisions about mid-cap pharmaceutical investments.

**Keywords:** Risk and Return analysis, Mid Cap Pharmaceutical Companies, Standard deviation

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### **INTRODUCTION TO STUDY**

The Indian pharmaceutical sector plays a crucial role in the economy, driven by growing healthcare demand and an expanding portfolio of treatments for life-threatening diseases. Mid-cap pharmaceutical companies, though offering significant growth potential, face higher risks than large-cap counterparts due to regulatory hurdles, high R&D costs, and intense market competition. These stocks are more volatile but offer opportunities for higher yields, making them appealing yet uncertain investments. This study assesses the balance between risks and rewards of mid-cap pharmaceutical stocks by analyzing historical performance and applying risk-adjusted metrics, helping investors and portfolio managers make informed decisions in a volatile market environment.

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### **NEED FOR THE STUDY**

The Indian pharmaceutical sector plays a vital role in the economy, with rising healthcare costs and growing demand for treatments driving significant investment in R&D. Mid-cap pharmaceutical companies, in particular, present high growth potential but come with elevated risks compared to large-cap firms. Given the sector's evolving regulatory landscape, increasing competition, and the impact of global health crises, understanding the risk-return trade-off in these companies is crucial. This research aims to provide insights for investors, financial analysts, and portfolio managers to make informed decisions by examining how mid-cap pharmaceutical firms navigate this balance.

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### **OBJECTIVES OF THE STUDY**

1. To analyse the historical returns of the top 5 mid-cap pharmaceutical companies in India over a specific period.
2. To assess the sensitivity and risk of selected companies by calculating their beta values and standard deviation against the broader market.
3. Provide investment recommendations based on the risk-return analysis of mid-cap pharmaceutical stocks.

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## HYPOTHESES

H<sub>0</sub>: There is no significant relationship-between the risk and return-of the selected mid-cap pharmaceutical companies. ( $r=0$ )

H<sub>1</sub>: There is a >significant relationship between the risk-and return-of-the selected mid-cap pharmaceutical companies. ( $r\neq 0$ )

H<sub>0</sub>: Market volatility does not significantly impact the returns of the selected mid-cap pharmaceutical companies. ( $M_1=M_2$ )

H<sub>1</sub>: Market volatility significantly impacts the returns of the selected mid-cap pharmaceutical companies. ( $M_1\neq M_2$ )

H<sub>0</sub>: There is no significant relationship between returns and market risk of selected companies. ( $r=0$ )

H<sub>1</sub>: There is a significant relationship between returns and market risk of selected companies. ( $r\neq 0$ )

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## REVIEW OF LITERATURE

**Rao et al. (2023)** examined the risk-return profiles of mid-cap pharmaceutical companies, finding that they are riskier but have higher growth potential compared to large-cap stocks, and recommended diversification to manage heightened risk exposure. **Meenakshi et al. (2022)** compared risk-return profiles in the Indian automobile sector, observing that companies like Maruti Suzuki exhibited higher risk and return, while Tata Motors showed more stability, emphasizing company-specific differences in risk tolerance. **Talwar et al. (2022)** applied CAPM to assess stock returns, concluding that CAPM is useful for estimating returns and identifying investment opportunities, particularly for long-term investors. **Bedanta Bora (2021)** analyzed the relationship between risk (measured by beta) and return in BSE Sensex companies, finding a positive correlation between risk and return, and concluded that riskier stocks tend to offer higher potential rewards. **Roni Bhowmik (2020)** studied the effect of stock market volatility on returns in global markets, emphasizing the need for advanced risk assessment tools like VAR to manage market risks effectively, particularly in times of financial turbulence. **Lakshman Raj Kandel (2018)** analyzed risk-return relationships for two commercial banks listed on the Nepal Stock Exchange, highlighting high unsystematic risk and recommending short selling as a risk management strategy. **Dr. P. Subramanyam et al. (2018)** assessed equity risk-return profiles in the secondary market, noting that market conditions significantly impact stock prices and that risk-return profiles are industry-specific, calling for tailored investment approaches. **Dr. M. Muthu Gopalakrishnan et al. (2017)** examined the risk-return profile of pharmaceutical companies, revealing that Sun Pharmaceutical had the highest returns but greater volatility, while Divi's Laboratories offered more stability with moderate risk and good returns, making them suitable for risk-averse investors.

### Research gap

This study addresses the gap in risk-return analysis focused on mid-cap pharmaceutical companies, as most research tends to emphasize large-cap or small-cap firms. It also highlights the unique challenges mid-cap pharmaceutical companies face, such as regulatory pressures, intense market competition, and innovation cycles, which influence their risk-return profiles differently. Filling this gap will provide valuable insights for investors and enhance understanding of risk-return dynamics in this specific sector.

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## LIMITATION OF THE STUDY

- The study uses past performance to estimate future risks and returns, but this may not always predict future outcomes, especially in a fast-changing sector like pharmaceuticals.
- The sample size of the study focuses only on five mid-cap pharmaceutical companies

Listed on the NSE. This limited scope may not fully capture the broader risk return of entire mid cap pharmaceutical sector.

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## TYPE OF THE RESEARCH

The study will use a quantitative research approach with descriptive and analytical methodology, examining historical financial data from platforms like Yahoo Finance and NSE/BSE. Descriptive statistics will summarize the data, while models such as standard deviation, beta, and correlation analysis will assess risk-return relationships. This method will help derive conclusions on the risk-return interplay and provide evidence-based investment recommendations.

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## SAMPLING METHOD

The study uses purposive sampling, selecting prominent mid-cap pharmaceutical companies in India based on specific criteria relevant to the research objectives. This non-probability technique ensures representative companies with substantial market presence are included, enabling a focused risk-return analysis. It provides key insights into the sector's risk-return dynamics.

## SAMPLE SIZE

The study's sample comprises top 5 mid-cap pharmaceutical companies of NSE: Aurobindo Pharma, Glenmark Pharmaceuticals, Alkem Laboratories, Lupin Ltd, and Divi's Laboratories.

## STATISTICAL TOOLS AND TECHNIQUES

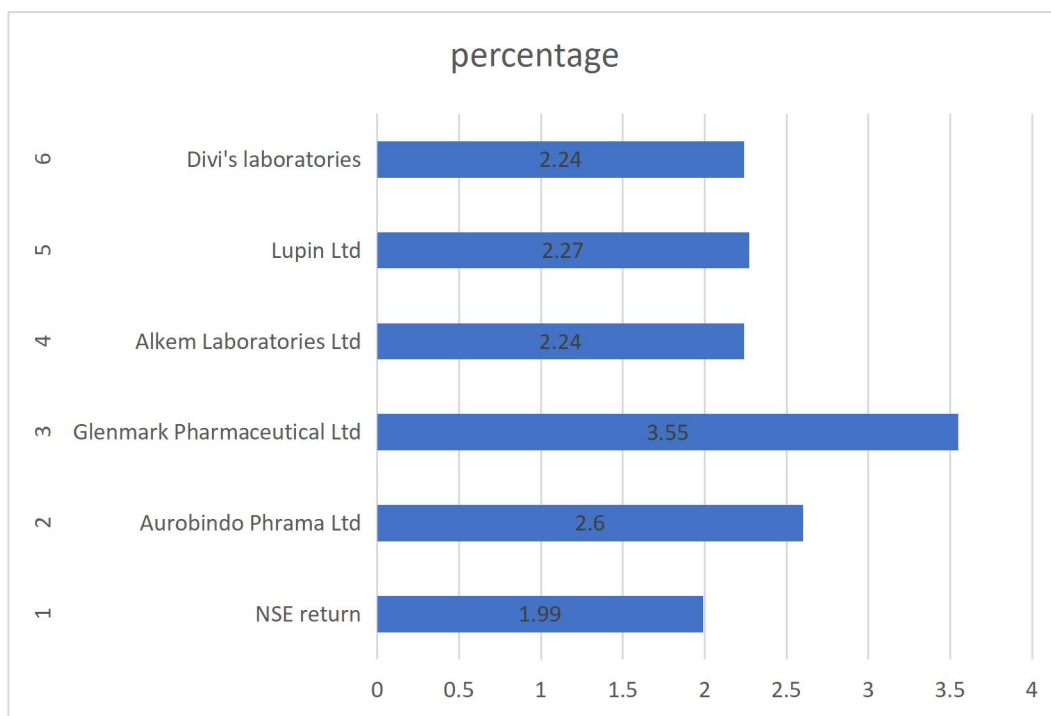
The data is analysed by using Microsoft Excel and SPSS software. The statistical tools used for this study are mean return, standard deviation, beta, alpha, correlation, t-test, for assessing the performance and risk.

## DATA ANALYSIS AND INTERPRETATION

**Table no 1: Showing market return and returns of top 5 pharmaceutical companies for the period of 1/Sep/2019 to 30/Aug/2024**

Sl no	Company	Percentage
1	NSE return	1.99
2	Aurobindo Phrama Ltd	2.6
3	Glenmark Pharmaceutical Ltd	3.55
4	Alkem Laboratories Ltd	2.24
5	Lupin Ltd	2.27
6	Divi's laboratories	2.24

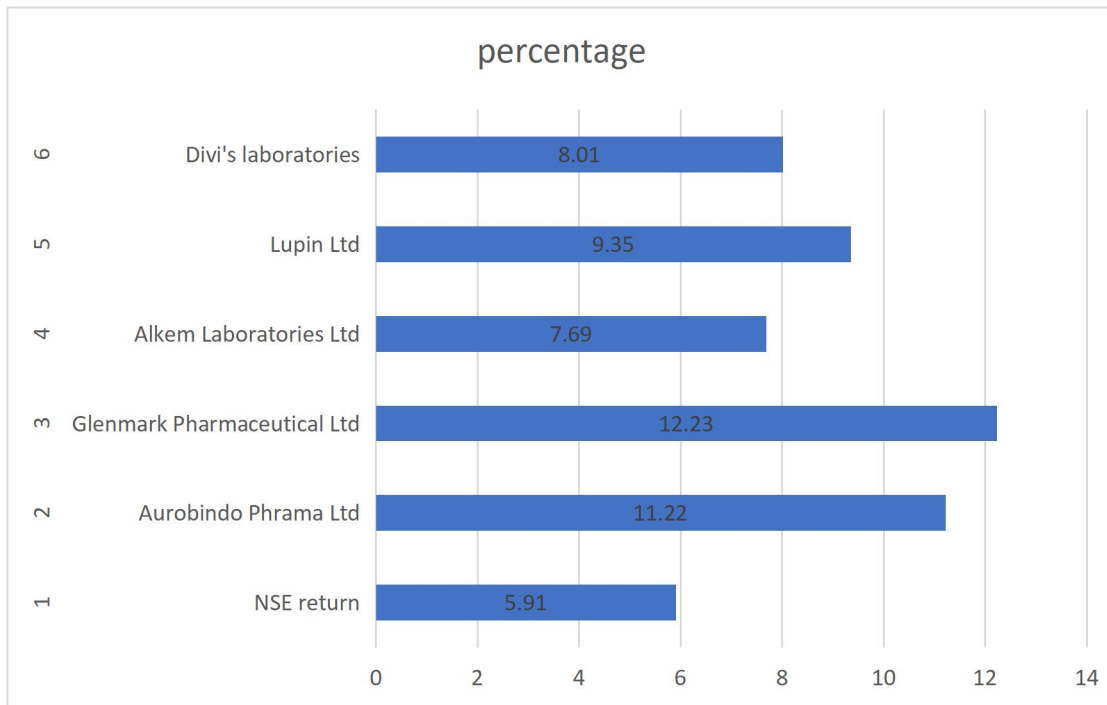
**Graph no 1: Showing market return and returns of top 5 pharmaceutical companies for the period of 1/Sep/2019 to 30/Aug/2024**



**Interpretation :** All the companies have outperformed the market returns. Showing that Glenmark Pharmaceutical Ltd has highest return, indicating strong long-term growth, likely driven by sustained market demand and effective strategic positioning. Which signifies investor confidence in its strategies for the period of 5 years.

**Table no 2: Showing the market's standard deviation and standard deviation of top 5 mid cap pharmaceutical companies for the period of 1/Sep/2019 to 30/Aug/2024**

Sl no	Company	Percentage
1	NSE	5.91
2	Aurobindo Phrama Ltd	11.22
3	Glenmark Pharmaceutical Ltd	12.23
4	Alkem Laboratories Ltd	<b>7.69</b>
5	Lupin Ltd	9.35
6	Divi's laboratories	8.01

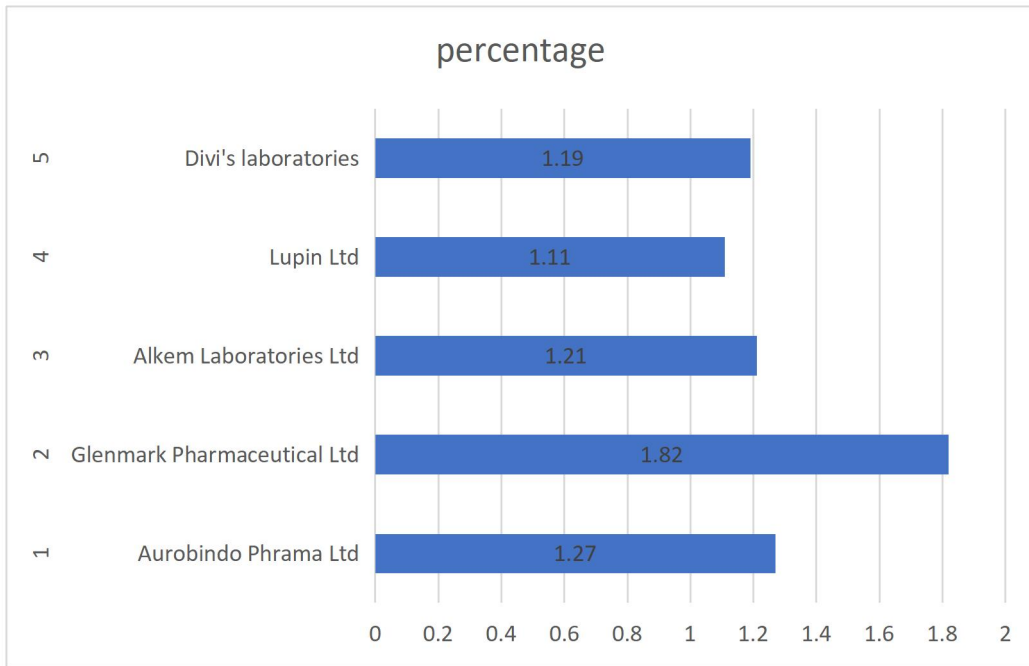
**Graph no 2: Showing the market's standard deviation and standard deviation of top 5 mid cap pharmaceutical companies for the period of 1/Sep/2019 to 30/Aug/2024**

**Interpretation :** The above data indicates that Alkem Laboratories has a lower standard deviation which denotes lower total risk compared to other companies. This suggests that its returns fluctuate less and are more stable. This indicates that the stock is less volatile, and investors might expect more predictable returns compared to higher-volatility stocks. In contrast, Glenmark Pharmaceutical have the highest standard deviation indicating higher risk compared to other companies.

**Table no 3: Showing the beta of top 5 mid cap pharmaceutical companies for the period of 1/Sep/2019 to 30/Aug/2024**

Sl no	Company	Percentage
1	Aurobindo Phrama Ltd	1.27
2	Glenmark Pharmaceutical Ltd	<b>1.82</b>
3	Alkem Laboratories Ltd	1.21
4	Lupin Ltd	1.11
5	Divi's laboratories	1.19

**Graph no 3: Showing the beta value of top 5 mid cap pharmaceutical companies for the period of 1/Sep/2019 to 30/Aug/2024**

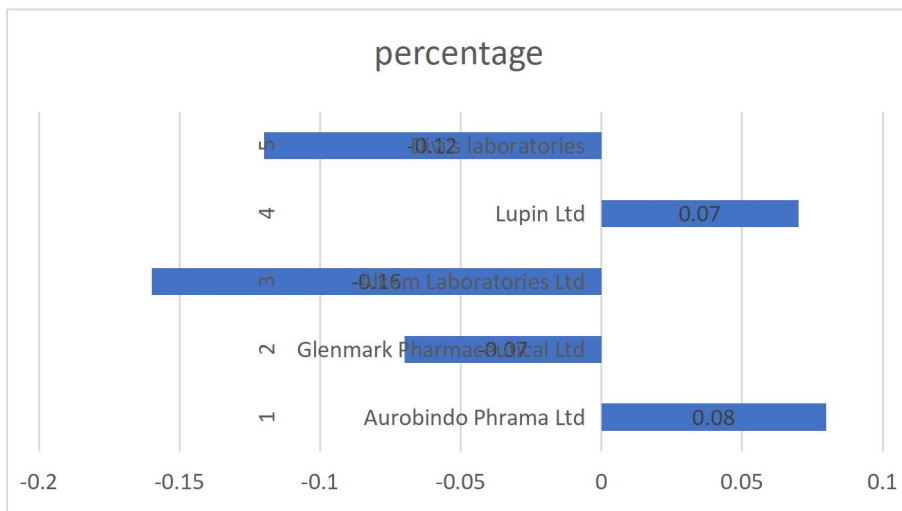


**Interpretation :** The beta analysis for the long-term (5 years) shows that Glenmark Pharmaceutical Ltd has the highest beta value, indicating increased sensitivity to market fluctuations and higher volatility over the extended period. Hence it is better to make investment in Glenmark Pharmaceuticals for the long-range planning horizon as it able to generate higher return with reference to the market changes. In contrast Lupin ltd has the lowest beta indicating a low degree of correlation with reference to change in market return.

**Table no 4 : Showing the alpha percentage of top 5 mid cap pharmaceutical companies for the period of 1/Sep/2019 to 30/Aug/2024**

Sl no	Company	Percentage
1	Aurobindo Phrama Ltd	0.08
2	Glenmark Pharmaceutical Ltd	-0.07
3	Alkem Laboratories Ltd	-0.16
4	Lupin Ltd	0.07
5	Divi's laboratories	-0.12

**Graph no 4 : Showing alpha value of top 5 mid cap pharmaceutical companies for the period of 1/SEP/2019 to 30/AUG/2024**



**Interpretation:** The alpha analysis shows that Aurobindo Pharma Ltd has the positive alpha without the impact of market return. A positive alpha suggests that the company has generated a return that is above the expected return. Glenmark Pharmaceutical Ltd has a negative alpha which indicates that the company has generated a return that is below the expected return.

#### Validation of Hypotheses for the period of 5 years :

##### 1. Risk-Return Relationship

Null Hypothesis ( $H_0$ ): There is no significant relationship between the risk and return of the selected mid-cap pharmaceutical companies. ( $r=0$ )

Alternative Hypothesis ( $H_1$ ): There is a significant positive relationship between the risk and return of the selected mid-cap pharmaceutical companies. ( $r \neq 0$ )

Correlations			
		Total Risk	Return
risk	Pearson Correlation	1	.862
	Sig. (2-tailed)		.060
	N	5	5
return	Pearson Correlation	.862	1
	Sig. (2-tailed)	.060	
	N	5	5

#### Interpretation

Based on the output the correlation ( $r$ ) value is 0.862 indicating that there is a direct relationship between risk and return of pharmaceutical companies. Hence null hypothesis ( $H_0$ ) is rejected and alternative hypothesis ( $H_1$ ) is accepted which suggests that there is a significant positive relationship between risk and return for the selected mid-cap pharmaceutical companies.

##### 2. Comparison of Sector Performance

Null Hypothesis ( $H_0$ ): The mean returns of mid-cap pharmaceutical companies are not significantly different from the returns of the broader market or sector index. ( $M_1=M_2$ )

Alternative Hypothesis ( $H_1$ ): The mean returns of mid-cap pharmaceutical companies are significantly different from the returns of the broader market or sector index. ( $M_1 \neq M_2$ )

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Pharma Co return	5	2.5800	.56316	.25185
Market return	5	1.9900	.00000 <sup>a</sup>	.00000

a. t cannot be computed because the standard deviation is 0.

One-Sample Test						
	Test Value = 0					
	t	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
return	10.244	4	.001	2.58000	1.8807	3.2793

#### Interpretation

The one-sample  $t$ -test result leads to the conclusion that the  $t$ -statistic is equal to 10.244, with degrees of freedom being 4, and the  $p$ -value is .001. Since the  $p$ -value is very much smaller than the default significance level of 0.05, we reject the null hypothesis and can be concluded that the mean returns of mid-cap pharmaceutical companies are significantly different from the returns of the broader market or sector index.

### 3. Returns and Beta relationship

H0: There is no significant relationship between returns and market risk of selected companies. ( $r=0$ )

H1: There is a significant relationship between returns and market risk of selected companies. ( $r\neq 0$ )

Correlations			
		return	beta
return	Pearson Correlation	1	.981**
	Sig. (2-tailed)		.003
	N	5	5
beta	Pearson Correlation	.981**	1
	Sig. (2-tailed)	.003	
	N	5	5

\*\* . Correlation is significant at the 0.01 level (2-tailed).

#### Interpretation

Based on the output the correlation ( $r$ ) value is 0.981 indicating that there is direct relationship between return and market risk. Hence null hypothesis ( $H_0$ ) is rejected and alternative hypothesis ( $H_1$ ) is accepted which suggests that there is a significant positive relationship between return and market risk for the selected mid-cap pharmaceutical companies.

### SUMMARY OF FINDINGS

- Glenmark Pharmaceutical Ltd has outperformed the market return of 1.99% with 3.55%
- Alkem laboratories ltd had the lowest standard deviation at 7.69%, reflecting higher volatility compared to the market's standard deviation of 5.91%.
- Glenmark had the highest beta value 1.82 indicating increased sensitivity to market movements.

### CONCLUSION

In conclusion, mid-cap pharmaceutical stocks present attractive opportunities for investors willing to accept higher risk for potentially greater rewards. Companies like Aurobindo Pharma and Lupin Ltd showed stronger risk-adjusted performance, while Glenmark Pharmaceuticals, despite high returns, had significant volatility and negative alpha, indicating poor compensation for risk. Divi's Laboratories and Alkem Laboratories offered more stability but lower returns, appealing to risk-averse investors. A well-diversified portfolio, considering risk-adjusted metrics like alpha, is essential for balancing risk and optimizing returns in this sector.

### SUGGESTIONS

- Glenmark Pharmaceutical Ltd has consistently outperformed the market, but its high beta indicates increased sensitivity to market movements. Suitable for investors with moderate risk tolerance.
- Aurobindo Pharma Ltd and Alkem Laboratories Ltd have shown higher volatility, reflected in their high standard deviations. More appropriate for aggressive investors seeking high rewards but not ideal for conservative investors.
- Diversification and risk management are essential to balance the risk-reward profile when holding stocks with higher volatility and market sensitivity.

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