Relationship Between Risk and Return in Indian Pharmaceutical's Sector

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Abstract:

This research paper aims to evaluate the risk and return dynamics of India's pharmaceutical industry, one of the most prominent sectors in the Indian economy. Investors and stakeholders must comprehend the sector's risk-return profile due to its significant expansion and significance in global supply chains. In order to quantify and analyse risk and return, the study uses historical data from top pharmaceutical businesses that are listed on the Indian stock exchange. To evaluate the industry's risk-adjusted returns, a number of financial measures are computed, such as the standard deviation. In order to assess the relative risk and profitability of the pharmaceutical industry, the study also contrasts its performance with that of more general market indices, including the NIFTY 50. elements include market competition, legislative changes, and technological advancements, and global health trends are discussed as potential sources of risk and their impact on return profiles. The results of the analysis are expected to provide valuable insights for investors seeking to navigate the pharmaceutical industry's volatility while maximizing returns. Additionally, the paper highlights the challenges and opportunities faced by the industry, contributing to a deeper understanding of its financial dynamics.

Introduction

The stock market plays a crucial role in global economies, serving as a platform for capital allocation and growth. In this context, pharmaceutical stocks have gained attention due to their impact on healthcare innovations and public health. However, investing in this sector requires a careful analysis of risk-return profiles, as stocks may exhibit high volatility, skewed returns, and diverse trends that influence investor decisions. Understanding the daily return patterns, risk factors, and market trends of key pharmaceutical companies is essential for investors aiming to balance potential gains with acceptable risk levels.

Research Question

This study explores the risk-return profiles of major pharmaceutical companies— Dr. Reddy's, Lupin, Auro pharma, Cipla, and Sun Pharma. The primary research question is: *How do the daily returns and risk characteristics of these stocks vary, and what investment recommendations can be made based on their risk-return profiles?* This question is addressed through an analysis of statistical measures, including daily mean returns, standard deviations, kurtosis, skewness, and trend indicators like Simple Moving Average (SMA) and Exponential Moving Average (EMA).

Overview of the Paper's Structure

This paper is structured as follows: First, the methodology section outlines the data collection and analysis techniques used to calculate the daily returns, standard deviations, and other statistical indicators. Following this, the interpretation of results provides an in-depth analysis of each stock's performance, including risk-return assessments and trend analyses. The recommendation section offers investment insights tailored to different risk tolerances based on the observed profiles. Finally, the conclusion summarizes the findings and highlights potential implications for investors in the pharmaceutical sector.

Literature Review:

- **Rohit & Bhavna (2018):**

An detailed study on the risk-return analysis of pharmaceutical companies in the Indian stock market was carried out by Rohit & Bhavna (2018), who specifically examined data from 2013 to 2018. According to their analysis, the pharmaceutical industry is characterized by high volatility even if it offers rich profits. They specifically emphasized how risky businesses like Sun Pharmaceuticals, which provide great returns but have a high beta, signify significant market risk. On the other hand, they believed Divi's Laboratories to be a better investment choice because of its high returns and low risk.

- **Moolbharathi & Sugandi (2021):**

The risk and return profiles of a few chosen pharmaceutical equities were contrasted with benchmark indices in India by Moolbharathi & Sugandi (2021). According to their

findings, because the pharmaceutical industry is defensive, it typically shows higher returns during recessions. They concentrated on comparing stock volatility with more general market patterns using regression analysis. The study offered insightful information on how pharmaceutical stocks might be a reliable investment, particularly during erratic economic times.

- **Ray et al. (2020):**

The effect of the COVID-19 pandemic on the risk and return of pharmaceutical stocks was investigated by Ray et al. (2020). According to their research, the pharmaceutical industry reported a rise in profits during the pandemic, especially for businesses engaged in the creation of vaccines and necessary medications. But the epidemic also brought with it other dangers in the form of altered regulations and supply chain interruptions. Their research is helpful in understanding how the financial performance of the pharmaceutical sector might be impacted by external shocks, such as a global health crisis.

- **Agrawal et al. (2020):**

The consequences of COVID-19 were further discussed by Agrawal et al. (2020), who concentrated on the larger supply chain problems that Indian pharmaceutical businesses were facing. Their study demonstrated that, despite their resilience, pharmaceutical stocks encountered difficulties as a result of global supply chain disruptions, raising the systematic risk for numerous businesses. In order to balance returns and lessen exposure to sector- specific hazards, the authors stressed the importance of market diversification in reducing these risks and urged investors to think about a more comprehensive portfolio approach.

- Susarla & Karimi (2018):

Susarla & Karimi (2018) examined how production planning and inventory management in the pharmaceutical supply chain impact risk and return in an indirect manner. They discovered that businesses that successfully controlled production schedules and inventory were able to reduce financial risk and increase total profits.

This element is essential to comprehending the operational risks that pharmaceutical companies encounter and how they affect the performance of their stocks.

Research Gap:

Research incorporating qualitative elements into risk-return models, like regulatory changes, is lacking.

- Although research has been done on the impact of external factors like COVID-19, nothing is known about the long-term repercussions of such shocks on the pharmaceutical industry.
- Risk-return analysis for pharmaceutical equities in India has not yet fully integrated sustainability and ESG (Environmental, Social, and Governance) considerations.

Methodology:

- **Data Collection and Analysis Using SMA**: Secondary stock price data for pharmaceutical companies on the NSE and BSE (2023- 2024) was analysed using the Simple Moving Average (SMA) to smooth fluctuations and reveal long-term trends in risk-return profiles.

- **Statistical Analysis Using ANOVA and Descriptive Statistics**: ANOVA tested for significant differences in returns across company sizes, while descriptive statistics (mean, standard deviation, range) summarized stock volatility and performance trends.

Results/Findings:

INTERPRETATION:

DAILY RETURN CALCULATION- DR REDDY

MEAN	0.011410337
STANDARD ERROR	0.01653439
MEDIAN	-0.00025677
MODE	#N/A
STANDARD DEVIATION	0.260383834

SAMPLE VARIANCE	0.067799741
KURTOSIS	218.912674
SKEWNESS	14.07343
RANGE	4.967365612
MINIMUM	-1
MAXIMUM	3.967365612
SUM	2.829763505
COUNT	248

1. Return Analysis

- **Mean Daily Return**: The mean return of approximately **0.0114** indicates a positive average daily return, which suggests that on average, Dr. Reddy's stock provided a modest positive return per trading day.
- **Median Daily Return**: The median return of **-0.00026** is close to zero, suggesting that, while there are some high returns, the typical daily return leans close to zero or even slightly negative. This may indicate occasional high positive returns that raise the mean more than the median.
- **Range and Maximum Returns**: With a **maximum return of 3.97** and a **range of 4.97**, Dr. Reddy's stock appears to have experienced some high positive daily returns. This can be appealing to investors looking for potentially large gains, though it's important to consider the associated risks.

2. Risk Analysis

- **Standard Deviation**: The daily return standard deviation of **0.2604** reflects the typical variation in returns around the mean, suggesting moderate volatility. For investors, this indicates that the stock can experience swings, which implies both opportunity for high returns and risk of losses.

- **Kurtosis**: A kurtosis of **218.91** is exceptionally high, suggesting that Dr. Reddy's returns are heavily concentrated around the mean, with infrequent but very large outliers. High kurtosis indicates "fat tails" in the return distribution, suggesting a potential for extreme losses or gains on rare occasions, which adds significant risk.

- **Skewness**: A skewness of **14.07** shows a strong positive skew, indicating that large positive returns are more frequent than large negative returns. This skewness suggests that while the stock may frequently yield modest or negative returns, there is potential for infrequent but sizable positive returns, which might be appealing to certain risk- tolerant investors.

- **Minimum Return**: The minimum daily return is **-1**, suggesting that the stock has seen some extreme losses, possibly even as a result of specific events affecting the stock or the broader market. This underscores the importance of risk management for investors in this stock.

3. Risk-Return Profile

- Dr. Reddy's stock appears to have a high-risk, high-reward profile. The high standard deviation, extreme kurtosis, and positive skewness indicate that while the stock can yield high returns, it also carries the possibility of large losses, and the distribution of returns is not normal. Investors should consider whether this level of risk aligns with their investment strategy, as they may face occasional large fluctuations.

RECOMMENDATION:

Dr. Reddy's stock may appeal to investors willing to accept high volatility and the potential for infrequent but significant positive returns. However, the high kurtosis and skewness signal substantial risk, including occasional sharp declines, so investors should weigh the potential returns against this risk profile carefully.

DAILY RETURN CALCULATION- LUPIN

MEAN	-0.006228726
STANDARD ERROR	0.00415851
MEDIAN	-0.00228158
MODE	#N/A

STANDARD DEVIATION	0.065488276
SAMPLE VARIANCE	0.004288714
KURTOSIS	216.9466117
SKEWNESS	-14.25410404
RANGE	1.060984383
MINIMUM	-1
MAXIMUM	0.060984383
SUM	-1.544724042
COUNT	248

1. Return Analysis

- **Mean Daily Return**: The mean daily return of **-0.0062** indicates a slightly negative average daily return, suggesting that, on average, Lupin's stock experienced a minor loss per trading day over the observed period. This may signal an overall downward trend or weakness in price performance.

- **Median Daily Return**: The median return is **-0.0023**, which is also negative and close to zero. This median, though slightly less negative than the mean, aligns with the overall negative return tendency.

- **Range and Maximum Returns**: With a **maximum daily return of 0.061** and a **range of 1.06**, the range of returns is relatively low compared to Dr. Reddy's stock. This smaller range indicates fewer extreme positive returns, with the maximum return reaching only around 6%.

2. Risk Analysis

- **Standard Deviation**: The standard deviation of **0.0655** is quite low compared to Dr. Reddy's, indicating relatively lower volatility in daily returns. This suggests that Lupin's stock is less volatile and could be considered relatively stable in terms of price movement.

- **Kurtosis**: With a kurtosis of **216.95**, Lupin's returns also have very high kurtosis, indicating a distribution with "fat tails." This implies that, despite the stock's generally low volatility, it has experienced rare extreme returns, primarily on the downside.

- **Skewness**: A skewness of **-14.25** reflects a strong negative skew, meaning that large negative returns are more likely than large positive ones. This tendency could indicate that the stock has occasionally suffered from sudden, sharp declines, which is concerning from a risk perspective.

- **Minimum Return**: The minimum daily return of **-1** implies that Lupin's stock has seen at least one extreme negative return, possibly due to significant adverse events affecting the stock or market.

3. Risk-Return Profile

- **Negative Return with Moderate Volatility**: Lupin's stock exhibits a generally stable price pattern with low daily return volatility, as seen in the low standard deviation. However, the average daily return is slightly negative, suggesting a weak or declining trend in returns.

- **High Downside Risk**: The negative skewness and high kurtosis signal a higher likelihood of sudden and extreme losses, despite the generally stable day-to-day return pattern. This makes Lupin's stock a risky investment for those who are concerned with sudden drawdowns, as it may encounter rare but substantial losses.

Recommendation:

Lupin's stock appears to have a low return with moderate risk on an average trading day, but with significant downside risk due to the potential for rare, large negative returns. This risk-return profile may not be attractive to conservative investors, as the stock shows limited upside potential but heightened vulnerability to severe losses.

DAILY RETURN CALCULATION - AUROPHARMA

MEAN	-0.005106535
STANDARD ERROR	0.004177219
MEDIAN	-0.000516049
MODE	#N/A

STANDARD DEVIATION	0.065782915
SAMPLE VARIANCE	0.004327392
KURTOSIS	214.0112301
SKEWNESS	-14.1062751
RANGE	1.074336944
MINIMUM	-1
MAXIMUM	0.074336944
SUM	-1.266420645
COUNT	248

1. Return Analysis

- **Mean Daily Return**: The mean return is **-0.0051**, indicating a slight negative average daily return, suggesting a minor daily loss in Aurobindo Pharma's stock over the observed period. This could point to a weak or declining trend in price.
- **Median Daily Return**: The median return of **-0.0005** is close to zero, showing that most daily returns are clustered around zero. However, the negative mean indicates that there are more frequent or larger losses than gains, resulting in a slightly negative trend.
- **Range and Maximum Returns**: The **maximum daily return of 0.0743** and a **range of 1.07** indicate limited upside potential, as the stock has not shown significant high positive returns in this period.

2. Risk Analysis

- **Standard Deviation**: The standard deviation of **0.0658** is relatively low, implying that Aurobindo Pharma's stock has low day-to-day volatility. This suggests it has relatively stable daily returns with smaller price fluctuations compared to highly volatile stocks.

Kurtosis: A kurtosis of **214.01** is exceptionally high, meaning the return distribution has "fat tails," with occasional extreme returns. High kurtosis suggests that, although daily returns are mostly stable, the stock has experienced rare but significant deviations, which increases risk.

Skewness: The skewness of **-14.11** shows a strong negative skew, indicating a higher likelihood of extreme negative returns compared to positive ones. This signals a high downside risk, where rare but large negative returns can occur.

Minimum Return: The minimum daily return is **-1**, suggesting at least one very sharp decline in value, possibly due to adverse events impacting the stock or sector.

Risk-Return Profile

Low Return with Downside Risk: Auropharma's stock has a low mean return with minimal daily volatility but significant downside risk. The strong negative skewness and high kurtosis suggest the stock could experience large, infrequent losses.

Stable Day-to-Day with Potential for Rare Losses: The low standard deviation shows stability in daily returns, which could appeal to risk-averse investors. However, the potential for large, infrequent negative returns due to skewness and kurtosis may be concerning for those unwilling to face sudden declines.

Recommendation:

Auropharma's stock shows low returns and limited daily volatility but high risk of rare, large losses. Investors should weigh this risk-return profile carefully, especially if they are seeking more stable returns without the risk of occasional sharp declines

DAILY RATE RETURN- CIPLA

MEAN		-0.004890845
	STANDARD ERROR	0.004163674
MEDIAN		-0.000242489
	MODE	#N/A

STANDARD DEVIATION	0.065569605
SAMPLE VARIANCE	0.004299373
KURTOSIS	217.053414
SKEWNESS	-14.2592615
RANGE	1.086148721
MINIMUM	-1
MAXIMUM	0.086148721
SUM	-1.212929654
COUNT	248

1. Return Analysis

- **Mean Daily Return**: The mean return of **-0.0049** indicates a slightly negative average daily return, suggesting that Cipla's stock experienced a minor daily loss over the observed period. This points toward a weak or slightly declining trend in price.

- **Median Daily Return**: The median of **-0.00024** is close to zero, meaning that most daily returns are small and close to zero. The negative mean, however, reflects that losses are more frequent or larger than gains.

- **Range and Maximum Returns**: With a **maximum return of 0.0861** and a **range of 1.0861**, Cipla's stock shows limited upside potential, as its highest return was about 8.6%.

2. Risk Analysis

- **Standard Deviation**: The standard deviation of **0.0656** is relatively low, suggesting that Cipla's stock has low day-to-day volatility. This reflects stable daily returns with smaller fluctuations.

- **Kurtosis**: The kurtosis of **217.05** is extremely high, indicating "fat tails" in the return distribution, with rare extreme returns. This high kurtosis means that although Cipla's stock generally has stable returns, it can experience occasional, substantial deviations from the mean.

- **Skewness**: A skewness of **-14.26** indicates a strong negative skew, meaning there's a higher likelihood of extreme negative returns compared to positive ones. This raises the risk of sudden, sharp declines.
- **Minimum Return**: The minimum daily return of **-1** suggests that the stock has experienced significant losses at least once, possibly due to a major adverse event.

3. Risk-Return Profile

- **Low Return with High Downside Risk**: Cipla's stock has low returns and moderate daily volatility but carries high downside risk. The strong negative skewness and high kurtosis indicate the possibility of large negative returns, despite its typical day-to-day stability.
- **Stable Daily Returns with Potential for Rare Losses**: The low standard deviation suggests stable daily performance, which might appeal to conservative investors. However, the potential for rare but large losses may be concerning for those not comfortable with occasional sharp declines.

Recommendation:

Cipla's stock exhibits low returns with moderate day-to-day stability but significant downside risk due to the potential for occasional extreme losses. This risk-return profile may not suit risk-averse investors seeking steady returns without the threat of rare, sharp downturns.

DAILY RETURNS CALCULATION- SUNPHARMA

MEAN	-0.005683454
STANDARD ERROR	0.004094682
MEDIAN	-0.001592401
MODE	#N/A
STANDARD DEVIATION	0.064483114
SAMPLE VARIANCE	0.004158072
KURTOSIS	231.4824549
SKEWNESS	-14.95754815
RANGE	1.041590909
MINIMUM	-1

MAXIMUM	0.041590909
SUM	-1.40949647
COUNT	248

. Return Analysis

- **Mean Daily Return**: The mean return is **-0.0057**, indicating a slightly negative average daily return, suggesting that Sun Pharma's stock experienced a small daily loss over the period. This points toward a weak or slightly declining trend in price.
- **Median Daily Return**: The median return of **-0.0016** is close to zero, meaning that most daily returns are near zero. However, the negative mean highlights that losses are slightly more frequent or larger than gains.
- **Range and Maximum Returns**: With a **maximum return of 0.0416** and a **range of 1.0416**, the stock shows limited upside potential, as its highest return was just over 4%.

2. Risk Analysis

- **Standard Deviation**: The standard deviation of **0.0645** is relatively low, implying that Sun Pharma's stock has low day-to-day volatility. This reflects stability in daily returns with smaller price fluctuations.
- **Kurtosis**: A kurtosis of **231.48** is exceptionally high, indicating "fat tails" in the return distribution. This suggests that although daily returns are typically stable, the stock has experienced occasional, large deviations, which raises risk.
- **Skewness**: The skewness of **-14.96** shows a strong negative skew, meaning that extreme negative returns are more likely than positive ones. This indicates a high downside risk, where rare but large losses could occur.
- **Minimum Return**: The minimum return of **-1** suggests that at least one day saw a significant loss, potentially due to adverse events impacting the stock or sector.

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3. Risk-Return Profile

- **Low Return with Downside Risk**: Sun Pharma's stock has low returns and moderate daily volatility but carries a high downside risk due to the strong negative skewness and high kurtosis. This indicates potential for large negative returns despite the typical stability in daily performance.

- **Stable Day-to-Day Performance with Potential for Extreme Losses**: The low standard deviation suggests steady daily performance, which might appeal to risk- averse investors. However, the potential for rare but severe losses could be concerning for those who are not comfortable with sudden sharp declines.

Recommendation: **Sun Pharma's stock exhibits low returns with moderate day-to-day stability but significant downside risk due to occasional extreme losses.** Investors should consider this risk-return profile carefully, especially if they prioritize consistency and are cautious of rare, severe declines.

Company	*Mean Daily Return*	*Standard Deviation*	*Maximum Return*	*Minimum Return*	*Risk Assessment*	*Return Assessment*
Dr. Reddy	0.0114	0.2604	3.97	-1	Highest volatility with potential for extreme gains	Highest mean return; performed best overall
Lupin	-0.0062	0.0655	0.06	-1	Moderate risk with significant downside potential	Negative mean return; poor performance

Aurobindo Pharma declines	-0.0051	0.0658	0.07	-1	Moderate risk with potential for sharp	Negative mean return; weak performance
Cipla high downside risk performance	-0.0049	0.0656	0.09	-1	Moderate risk with	Negative mean return; poor
Sun Pharma potential	-0.0057	0.0645	0.04	-1	Moderate risk with extreme downside	Negative mean return; poor performance

Overall Assessment:

Best Performing: **Dr. Reddy**, with positive mean return and higher upside potential, though with high volatilit

Poor Performing: **Lupin, Aurobindo Pharma, Cipla,** and **Sun Pharma** all have negative mean

ANOVA:

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Auropharma	249	-1.23655	-0.00497	0.004315
Daily return of lupin	249	-1.53528	-0.00617	0.004272
Daily return of cipla	249	-1.1873	-0.00477	0.004286
Daily return of Sun pharma	249	-1.40114	-0.00563	0.004142

daily return of dr reddy	249	-2820.1	-11.3257	7931.651		

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	25527.39392	4	6381.848	4.023018	0.003017	
Within Groups	1967053.625	1240	1586.334			
Total	1992581.019	1244				

Risk and Return Recommendation:

- **For Risk-Adjusted Return**: Based on the data, **Auropharma** seems to be the best option. It has a low variance (indicating consistent returns) and a relatively small negative average return. This suggests it provides a stable but slightly negative return with manageable risk.
- **For High Risk, High Reward**: **Dr. Reddy's** has the potential for large swings due to its high variance, but its return is highly negative, indicating that while it may provide high reward in some situations, it is highly risky and undesirable in this context.
- **Avoiding Excessive Risk**: While **Lupin**, **Cipla**, and **Sunpharma** are also relatively stable, their returns are slightly more negative than Auropharma's, and their variances are higher than Auropharma's.

RECOMMENDATION:

- **Best stock for minimizing risk while maintaining stable returns**: **Auropharma**.
- **Least favorable stock due to high volatility and negative returns**: **Dr. Reddy's**.

Thus, for a more risk-averse approach, Auropharma is recommended, while Dr. Reddy's should be avoided.

MOVING AVERAGES:

Stock	Date (Latest)	SMA (5 days)	EMA (5 days)	Price Trend	Interpretation
Auro Pharma	11-Nov-24	1,287.90	1,287.90	Bullish	The stock shows a consistent upward trend, with the **EMA** being aligned with the **SM** suggesting **stability** and **positive mark sentiment**.
Lupin		2,084.90	2,084.90	Neutral to Bullish	
Cipla	11-Nov-24	1,552.80	1,552.80	Bearish	The stock has shown **negative returns** with **EMA** lagging behind **SMA**, indicating **bearish** trend. Caution is advised for sho term positions.
Sun Pharma	11-Nov-24	1,794.60	1,794.60	Bullish	**EMA** leads **SMA**, suggesting an **upwar price trend**. Both indicators align, confirmi **bullish sentiment** and a good outlook f investors.
Dr. Reddy's	11-Nov-24	1,287.90	1,287.90	Bearish	The **EMA** is reacting quickly to downward movements, showing a **bearish** outlook. T **SMA** is above the **EMA**, indicati underperformance.

Interpretation

Auro Pharma: Both the **SMA** and **EMA** show a **stable and positive trend**, indicating that the stock has be consistently performing well. The **bullish** sentiment is confirmed by the **EMA**'s alignment with the **SMA**.

Lupin: The stock shows moderate performance, with **SMA** and **EMA** being close to each other. This indicat that the stock is neither strongly bullish nor bearish, but can be considered **neutral to bullish**.

Cipla: The stock shows negative returns and a **bearish** trend. The **EMA** being below the **SMA** signals **negati price movement**, which may indicate potential risks for short-term investors.

Sun Pharma: With both **SMA** and **EMA** showing an upward trend, **Sun Pharma** demonstrates **bulli** momentum. The **EMA** leading the **SMA** suggests that the stock is gaining positive investor sentiment and has good potential for growth.

- **Dr. Reddy's**: The performance of **Dr. Reddy's** indicates a **bearish** trend, with **EMA** being more reactive to price movements, signaling volatility and downward movement.

RECOMMENDATION:

Based on the **SMA** and **EMA** analysis of the five stocks, **Auro Pharma** and **Sun Pharma** show the most promising **bullish** trends, while **Cipla** and **Dr. Reddy's** show **bearish** tendencies. **Lupin** remains in a **neutral to bullish** range. Investors looking for stable growth may favor **Auro Pharma** and **Sun Pharma**, while those seeking caution might reconsider positions in **Cipla** and **Dr. Reddy's**.

Discussion and Findings:

Risk and Return Recommendations

1. **For Risk-Adjusted Return**:

Because of its low variance and somewhat negative average return, Auro Pharma is the best choice among these stocks for risk-adjusted returns. Even if this points to a moderate performance in absolute terms, investors who value stability over rapid development will find Auro Pharma appealing due to its consistency and acceptable risk profile.

High Reward, High Risk:

Dr. Reddy's exhibits the potential for huge swings due to its high variance, which could appeal to investors eyeing high-risk, high-reward prospects. Its extremely negative returns, however, show that although the stock might occasionally see price increases, it is generally risky and, in this situation, might not be as appealing.

Compared to Auro Pharma, Lupin, Cipla, and Sun Pharma exhibit somewhat lower returns and greater variations, despite their relative stability. They might not be the greatest option for investors who are risk adverse, but they might be appropriate for those who are prepared to put up with little returns variations in exchange for moderate growth potential.

Overall Evaluation

Best Performing: Despite its high volatility, Dr. Reddy's has the highest positive mean return and offers upside potential, making it a good fit for aggressive investment strategies.

Poor Performing: With differing degrees of steadiness, Lupin, Auro Pharma, Cipla, and Sun Pharma all have negative mean returns. But Auro Pharma stands out as a reliable choice, whereas Sun Pharma and Lupin offer a little more volatility, and Cipla poses more danger because of its bearish tendency.

Limitations:

Industry Scope: The study's focus on the Indian pharmaceutical industry restricts the findings' generalizability to other sectors or international pharmaceutical marketplaces.

Data Restrictions: The research might not adequately reflect global competitive forces or regulatory frameworks impacting global actors in the pharmaceutical industry if it just looks at Indian-listed companies.

Sector-Specific Volatility: The generalizability of results may be limited by the sensitivity of pharmaceutical equities to changes in regulations, R&D findings, and patent disputes, which may not accurately reflect risk-return profiles in other industries.

Conclusion:

Five significant Indian pharmaceutical equities' risk-return trends are examined in detail in this study. While Cipla and Dr. Reddy's exhibit negative tendencies, indicating increased risk, Auro Pharma and Sun Pharma exhibit bullish trends, making them appealing to investors who value stability. Lupin is still rather bullish and appropriate for risk-reduction plans.Because of its low variance, Auro Pharma is the best option for risk-adjusted returns, whereas Dr. Reddy's high volatility makes it suitable for investors seeking high risk and big reward. Although the results offer practical insights into the pharmaceutical industry in India, adding qualitative information and cross-industry comparisons could improve investment suggestions even further.

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