

PROJECT REPORT

ON

OPTION TRADING STRATEGIES

PRESENTED BY

GROUP 11

UNDER THE GUIDANCE OF
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Course Code: FIN F311
Course Title: Derivatives & Risk Management



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BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE,
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STOCKS



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STOCK A:

SUN PHARMACEUTICAL INDUSTRIES LIMITED



SECTION 1:

FORMING EXPECTATIONS FOR STOCK PRICES USING FUNDAMENTAL ANALYSIS AND INDICATORS

1.)Return On Equity(ROE) measures the ability of a firm to generate profits from its shareholders investments in the company (in this case, Sunpharma).

2.)The ROE % has been increased from MAR 18 to MAR 20 and then slight decline in MAR 21 . But, a substantial drop was observed from MAR 21 to MAR 22.

The table given below shows the %ROE of the past five years, and below is the average value of 1,3 and 5 years.

KEY FINANCIAL RATIOS OF SUN PHARMACEUTICAL INDUSTRIES (in Rs. Cr.)	MAR 22	MAR 21	MAR 20	MAR 19	MAR 18
Return on Networth / Equity (%)	-0.40	8.54	13.16	3.57	1.36

ROE%



Price to Earnings ratio (P/E) ratio

1.) P/E Ratio or Price to Earnings Ratio is the ratio of the current price of a company's share in relation to its earnings per share(EPS).

2.) Price to Earnings Ratio is one of the most widely-used metrics by analysts and investors worldwide. It signifies the amount of money an investor is willing to invest in a single share of a company for Re. 1 of its earnings.

3.) If a company has a high P/E ratio, it demonstrates that either the company is demonstrating a growth trajectory or is overvalued. This high P/E ratio may also imply that the company is expected to increase its revenue in the future, and this phenomenon will lead to a surge in its stock price.

4.) Sunpharma's high PE ratio signifies that the stock is highly overvalued, so the stockholders believe that the revenue will increase in subsequent time and thus is expected to show bullish sentiments.



SALES GROWTH

1.) The sales growth chart shows the compounded growth in net sales for the past 1,3, and 5 years.

The graph below shows the past five years' net sales figures and the CAGR(Compound Annual Growth Rate)%. (values Of the Graphs are in Crores).

2.) The consistent growth in CAGR sales indicates a bullish trend in stock prices for the next quarter.

CAGR Return : 9.9%



Sales Growth



INCOME STATEMENT

Financial Year	FY 2021	FY 2022	TTM
Total Revenue	34,357.31	39,729.96	42,776.60
EBITDA ↕	5,020.75	6,752.41	7,624.11
PBIT ↕	2,940.80	4,608.67	5,209.74
PBT ↕	2,799.37	4,481.32	5,093.14
Net Income ↕	2,903.82	3,272.73	4,230.90
EPS	12.10	13.64	17.63
DPS	7.50	10.00	10.00
Payout ratio	0.62	0.73	0.57

This chart shows that the revenue and net income have increased from FY 2021 to FY 2022. Also, the EPS(Earnings per Share ratio) has increased from 12.10 to 13.64 from FY 2021 to FY 2022, indicating a bullish trend in stock prices.

PEER COMPARISON

Stock	FY PE Ratio
Sun Pharmaceutical Industries Ltd	72.41
Dr Reddy's Laboratories Ltd	36.97
Cipla Ltd	28.99
Torrent Pharmaceuticals Ltd	69.22

- 1.) Sun Pharmaceuticals has consistently outperformed other competitors in terms of the PE ratio.
- 2.) The higher PE ratio shows that investors would be willing to buy Sun Pharma Stock and thus indicating bullish expectations.

Standard And Poor's Pharmaceutical Index (S&P Pharma)



The S&P Pharmaceutical Index is slightly declining, indicating that the pharmaceutical industry will experience bearish stock prices in the upcoming months of Feb-March 2023. Since pharma

COMPANY INVESTMENTS AND CONTRIBUTION IN RESEARCH AND DEVELOPMENT

R&D investments were approximately 22 Billion, at 5.8% of overall sales. During the year, Sunpharma filed approximately 200 formulation dossiers globally. Some of the clinical trials for specialty products got delayed during FY22 due to the pandemic but are expected to normalize gradually in FY23, Quarter 1.

This behavior of the company is assertive towards R&D, and so the stock price is expected to be slightly bullish in March-April 2023.

SUMMARY -

- 1) Over the past few years, the growth in sales of Sunpharma has been quite substantial. Also, the PE ratio is relatively high.
- 2) This company's revenue and net Sales have risen steadily over the past few years.
- 3.) Over the last five years, revenue has grown at a yearly rate of 4.29%, vs. an industry avg of 7.66%.
- 4.) Over the last five years, the market share decreased from 16.65% to 13.65%.

With these indicators, we can expect an almost neutral trend with these expectations in stock prices for Share Sun Pharmaceutical Industries Private Limited.

SR NO.	MONTH	STOCK EXPECTATION
1.	FEBRUARY	Moderately Bearish
2.	MARCH	Slightly Bearish
3.	APRIL	Slightly Bullish

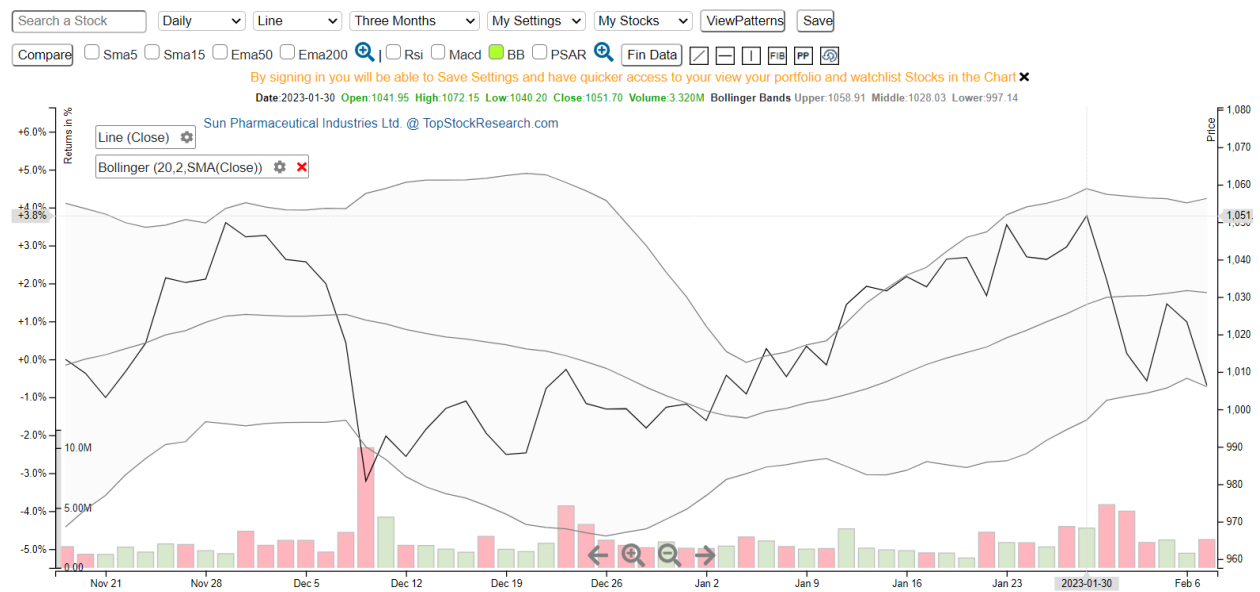
SECTION B: **FORMING EXPECTATIONS FOR STOCK PRICES USING** **TECHNICAL INDICATORS AND ANALYSIS**

1. Bollinger Bands

Bollinger bands consist of 3 lines:

- a. Lower Band: Middle band - 2 standard deviation
- b. Middle Band: SMA of prices
- c. Upper Band: Middle Band + 2 standard deviation

If the market is stable, the bands contract, and when the market is volatile, the bands widen. If the price touches the upper band, it indicates that the stock is overbought. When the line touches the lower band, it indicates that the stock is oversold.



On Jan 30th, The stock price line is close to the upper band, giving a slightly bearish signal.

2. MACD Indicator

The Moving Average Convergence/Divergence indicator is a momentum oscillator primarily used to trade trends. It appears on the chart as two lines that oscillate without boundaries. The crossover of the two lines gives trading signals similar to a two-moving average system.

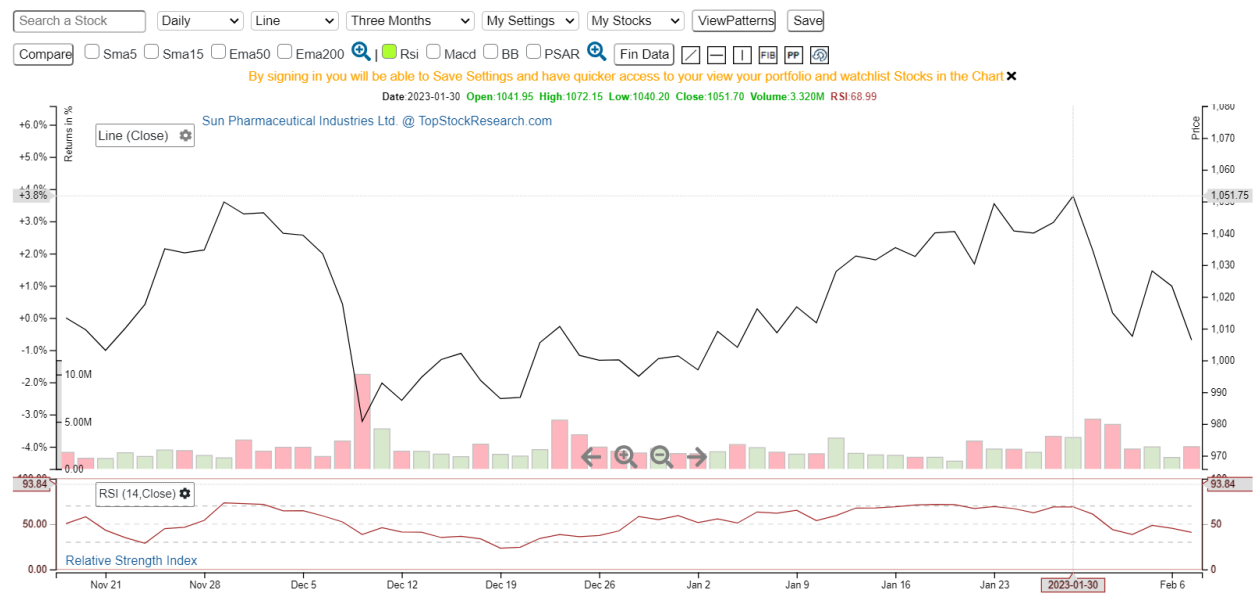
MACD crossing above zero is considered bullish while crossing below zero is bearish. Secondly, when MACD turns up from below zero, it is considered bullish. When it turns down from above zero, it is considered bearish.



The MACD indicator on Sunpharma gave a bearish signal as it crossed the signal line to go down.

3. RSI

The Relative Strength Index (RSI) is a momentum oscillator that measures the speed and change of price movements. The RSI oscillates between zero and 100. Traditionally the RSI is considered overbought when above 70 and oversold when below 30. Signals can be generated by looking for divergences and failure swings. RSI can also be used to identify the general trend.



The RSI line is closer to 70, giving a slightly bullish signal.

4. MFI Indicator

The Money Flow Index (MFI) is a momentum indicator that measures the flow of money into and out of a security over a specified period of time. It is related to the Relative Strength Index (RSI) but incorporates volume, whereas the RSI only considers the price. The MFI is calculated by accumulating positive and negative Money Flow values (see Money Flow), then creating a Money Ratio. The Money Ratio is then normalized into the MFI oscillator form. Oversold levels typically occur below 20, and overbought levels typically occur above 80.

SECTION 3: DESIGNING OPTION TRADING STRATEGIES FOR THE GIVEN STOCK

1 - Month Strategy – Moderately Bearish

- **Optimal Strategy** - Buy Puts
- Here, We would suggest investors to take heavy put position in the stock because the technical analysis shows that the upcoming trend for Sunpharma is bearish and the S&P index for pharmaceuticals index is also expected to go down making the probability of sun pharma going down to be very high and hence investors can take up a heavy position on puts where there potential risk is only going to be that of the initial premium paid while the upside is huge.
 - If the investor is heavily risk averse, they can take up long positions on call which can hedge their positions.

Specifics:

- **Payoff matrix:**

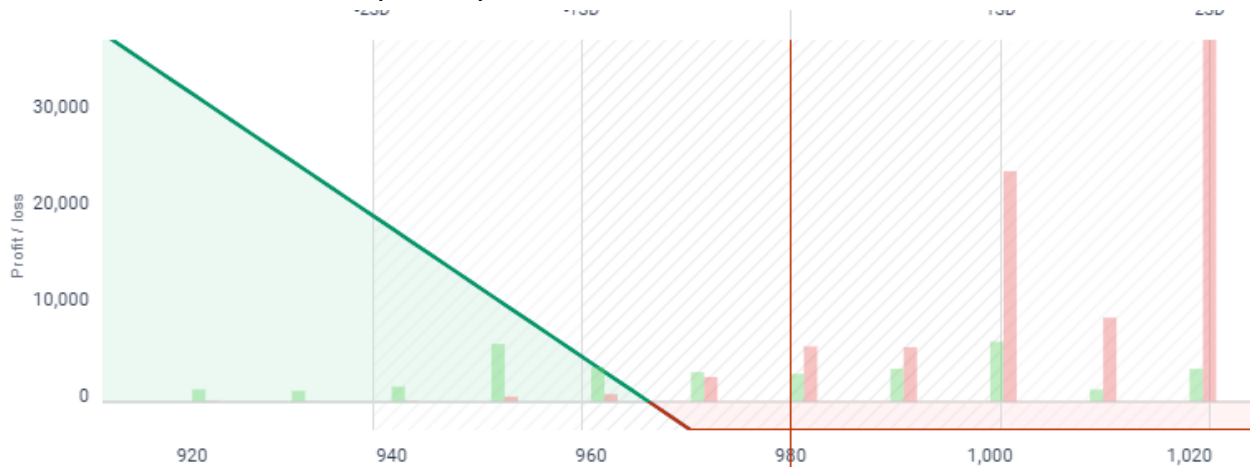
Underlying Asset Price	Payoff
$S < K$	$S - K$
$K < S$	0

Where:

Current price of our asset = S (**Rs 980**)

Buy 1 put option with strike price = K (**Rs 970**)

- Break-Even Price: **K (Rs 970)**



- Max Profit: $S - K$ (**Not limited could be as high as possible**)
- Max Loss: 0 (Initial premium price is excluded)

2 - Month Strategy – Slightly Bearish

- **Optimal Strategy** - Bear Put Strategy
- Considering a bearish run for the past month we can expect Sunpharma to take corrective measure and hence the stock might recover slightly but we still expect it to remain below it's current price and hence taking a slightly bearish position on it.

In this strategy, We buy a put option on the underlying asset while simultaneously selling another put option at a lower strike price.

The main idea behind this strategy is to limit our downside risk while still benefitting from a potential decline in the stock price. The long put option provides protection if the underlying asset's price drops significantly, while the short put option helps to offset the cost of the long put option.

Specifics:

- Payoff matrix:

Underlying Asset Price	Payoff from long put option	Payoff from short put option	Total Payoff
$S < K1$	$K2 - S$	$-(K1 - S)$	$K2 - K1$
$K1 < S < K2$	$K2 - S$	0	$K2 - S$
$K2 < S$	0	0	0

Where:

Current price of our asset = S (**Rs 980**)

Buy 1 put option with strike price = K2 (**Rs 1000**)

Sell 1 put option with strike price = K1 (**Rs 960**)

- Break-Even Price: **S (Rs 980)**



- Max Profit: $K2 - K1$ (**Rs 40 per contract**)
- Max Loss: 0

3 - Month Strategy – Neutral Markets

- **Optimal Strategy** - Iron Condor Strategy
- We can expect sun pharma to recover from the recent bearish trends and the pharma industry, in general, to go through a corrective phase and correct itself. Our expectation would be for the price to fall within the range of its current price.

In this, we take a position on four securities, two calls, and two puts.

- We choose four strike prices, Two strikes will be for the call options and two for the put options. The call options should be above the underlying asset's current price, while the put options should be below it. The difference between the two strike prices should be the same for both call and put options. This will create a "wing" shape in the options chain.

Specifics:

- Payoff matrix:

Underlying Asset Price	Total Payoff
$S < K4$	$P - (K3 - K4)$
$K4 < S < K3$	$P - (K3 - S)$
$K3 < S < K2$	P
$K1 < S < K2$	$P - (S - K1)$
$K2 < S$	$P - (K2 - K1)$

Where:

Final price of our asset = S (**Rs 980**)

Sell 1 call option with strike price = K1 (**Rs 1000**)

Buy 1 call option with strike price = K2 ($K2 > K1$) (**Rs 1020**)

Sell 1 put option with strike price = K3 (**Rs 980**)

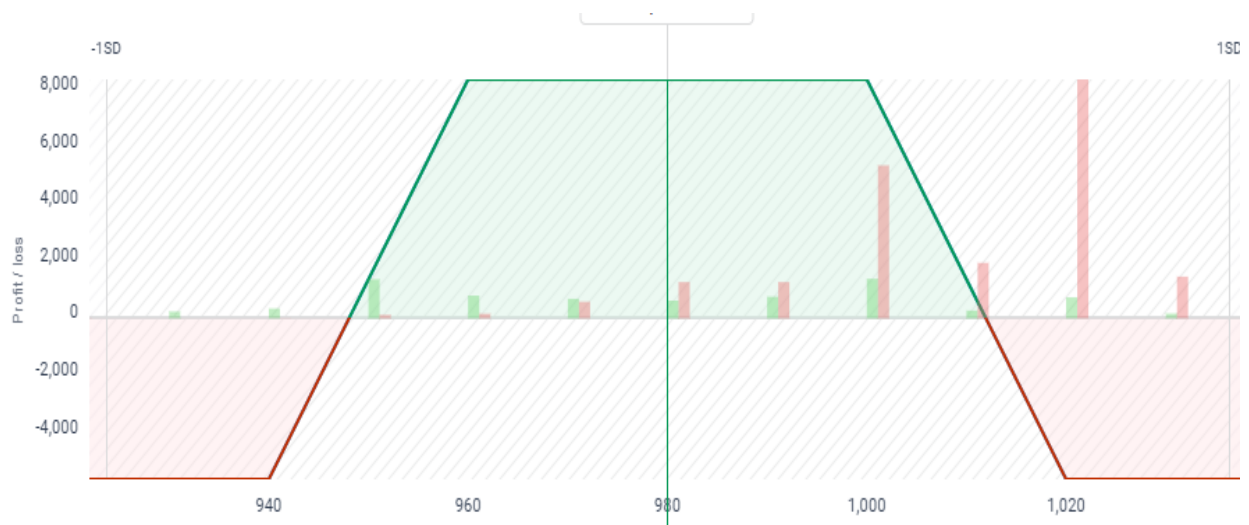
Buy 1 put option with strike price = K4 ($K4 < K3$) (**Rs 960**)

Net Premium Received = P (**Rs 15 Avg**) → **Initial Cash Flow**

- Break-Even Price:

Upper Breakeven price: $K1 + P$ or **Rs 1015**

Lower Breakeven price: $K3 - P$ or **Rs 965**



- Max Profit: P (**Rs 15 per contract**)
- Max Loss: P - (K3-K4) (**Rs -5 per contract**)

STOCK B: EICHER MOTORS LTD



SECTION 1: FORMING EXPECTATIONS FOR STOCK PRICES USING FUNDAMENTAL ANALYSIS AND INDICATORS

- 1.) quarter ended December 31, 2022 (Q3 FY23), riding on strong sales, as compared to ₹456 crore in the same period last fiscal.
- 2.) The company said its commercial vehicle joint venture Volvo Eicher Commercial Vehicle (VECV) recorded its highest ever third quarter sales at 18,162 units, a growth of 13% over the corresponding period last year. 2-wheeler arm Royal Enfield clocked total dispatches at 2,19,898 motorcycles, up 31% over last year.
- 3.) Eicher Motors (EIM) Q3 EBITDA rose 47% YoY (inline with JEFc) to a new high. RE volumes grew 31% YoY while EBITDA/vehicle was flat QoQ. Despite the ongoing 2W downturn, we believe EIM is on track to deliver the highest RE volumes and EPS in FY23E. We see multiple tailwinds for RE: 2W demand recovery, industry premiumization, limited competition and low EV risk. We don't see evidence of any significant cannibalization from Hunter either," said global brokerage Jefferies.
- 4.) The global brokerage has retained Buy rating on Eicher Motor Shares with a target price of ₹4,250 apiece, on good Q3 and believes it is on-track for its best year amid an industry downturn.
- 5.) The company's **Price-to-Earnings (P/E) ratio** is 40.6, which is calculated by dividing the current market price of the company's stock by its earnings per share (EPS). This ratio is commonly used to assess the valuation of a company's stock relative to its earnings. A higher P/E ratio generally indicates that the market has higher expectations for the company's future earnings growth.

Additionally, the sector P/E ratio is 62.51, which is the average P/E ratio of companies within the same sector as the company in question. The sector P/E ratio is often used as a benchmark to compare the valuation of a specific company against its industry peers.

Valuation Ratios	Mar 2022	Mar 2021
P/E (x)	40.06	52.82
P/B (x)	5.34	6.22
EV/EBITDA (x)	24.72	29.31
P/S (x)	6.53	8.16



Note: High PE if PE \geq 80 percentile, Low PE if PE \leq 30 percentile and Average PE if 30 < PE < 80 percentile (calculations based on 3 years data)

Compound Annual Growth Rate (CAGR) of Sales:

- The **CAGR of sales** is calculated at 2.52% over the specified period. CAGR is a measure of the average annual growth rate of a particular variable, such as sales, over a specific period of time, taking into account the effect of compounding. In this case, the sales of the company grew at an average annual rate of 2.52% over the specified period.

Compound Annual Growth Rate (CAGR) of Profit:

- The **CAGR of profit** is calculated at -9.23% over the specified period. CAGR is a measure of the average annual growth rate of a particular variable, such as profit, over a specific period of time, taking into account the effect of compounding. In this case, the profit of the company declined at an average annual rate of -9.23% over the specified period.

Return on Equity (ROE):

The Return on Equity (ROE) is calculated at 13.29%. ROE is a financial ratio that measures the profitability of a company by comparing its net income to its shareholders' equity. It indicates how effectively a company is using its shareholders' equity to generate profits. In this case, the company's net income represents 13.29% of its shareholders' equity, which indicates a relatively good profitability performance.

It's important to note that these financial metrics provide insights into the company's financial performance over a specific period of time and should be interpreted in conjunction with other relevant financial and operational information for a comprehensive understanding of the company's overall financial health.

Growth Ratios	Mar 2022	Mar 2021
3 Yr CAGR Sales (%)	2.52	-1.37

3 Yr CAGR Net Profit (%)	-9.23	-17.29
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Return Ratios	Mar 2022	Mar 2021
Return on Networth / Equity (%)	13.29	11.77

DEBT TO EQUITY RATIO

- 1.) Debt-to-equity ratio is a financial metric that compares a company's total debt to its total equity, indicating the proportion of a company's funding that comes from debt versus equity.
2.) A debt-to-equity ratio of 0.01 in the previous year and 0.00 in the current year indicates a significant change in the company's financial structure.
3.) The company's debt-to-equity ratio dropped to 0.00, which means that the company has no debt and its financing is entirely based on equity.
- 4.) This significant change in the debt-to-equity ratio indicates that the company has paid off all its debt or has not taken on any new debt during the current year.
- 5.) This could indicate a lower financial risk as the company has reduced its reliance on debt and is relying more on equity financing, which may provide increased stability and flexibility in the company's financial position.

Leverage Ratios	Mar 2022	Mar 2021	Mar 2020	Mar 2019	Mar 2018
Debt to Equity (x)	0.00	0.01	0.01	0.02	0.02

SUMMARY:

1. The company's P/E ratio of 40.6 implies high expectations for earnings growth, but compared to its industry peers with a sector P/E ratio of 62.51, it may be relatively undervalued.
2. The company experienced a positive compound annual growth rate (CAGR) of 2.52% in sales, but a negative CAGR of -9.23% in profit over the specified period.
3. The company's Return on Equity (ROE) is 13.29%, indicating a relatively good profitability performance as it effectively utilizes its shareholders' equity to generate profits.
4. The company's debt-to-equity ratio decreased significantly to 0.00, indicating lower financial risk and increased stability due to reduced reliance on debt and reliance on equity financing.

With these indicators, we can expect an almost neutral trend with slight bearish nature for the stocks of Eicher Motors.

Sr. No.	Month	Stock Expectation
1.	February	neutral with slight bearish
2.	March	moderately bearish
3.	April	neutral

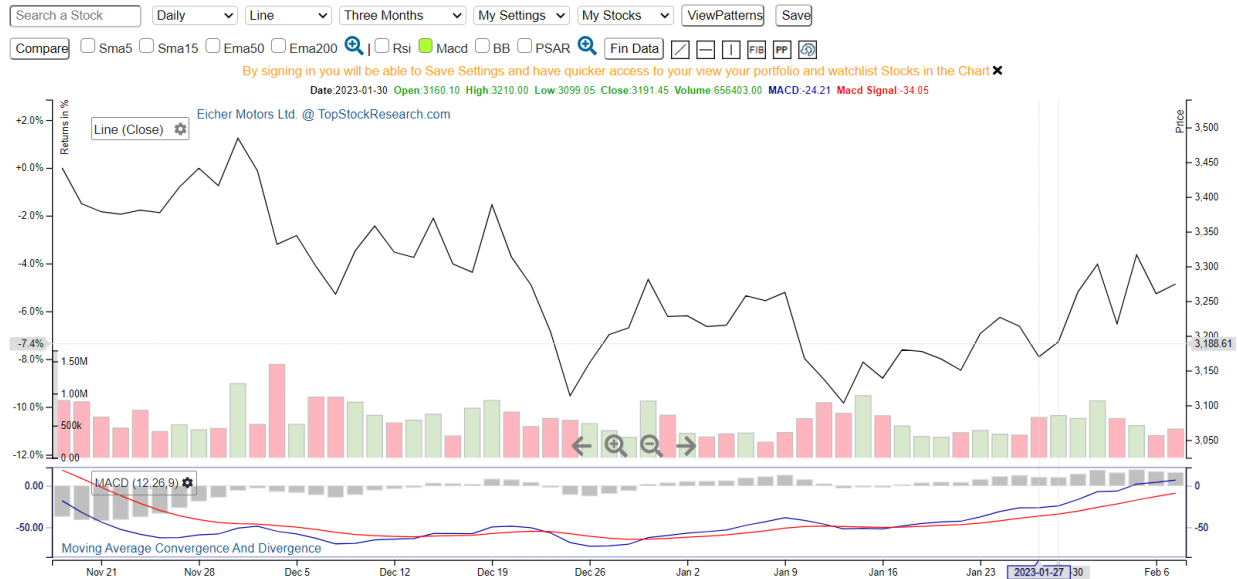
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1. Bollinger Bands

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If the market is stable, the bands contract, and when the market is volatile, the bands widen. If the price touches the upper band, it indicates that the stock is overbought. When the line touches the lower band, it indicates that the stock is oversold.



In the chart above, we can see that the MACD line is above the signal line on Jan 30th. This indicates that the market is bullish.

3. RSI

The Relative Strength Index (RSI) is a momentum oscillator that measures the speed and change of price movements. The RSI oscillates between zero and 100. Traditionally the RSI is considered overbought when above 70 and oversold when below 30. Signals can be generated by looking for divergences and failure swings. RSI can also be used to identify the general trend.



The RSI line is between 30 and 70, close to 50. This gives a neutral signal.

4. MFI Indicator

The Money Flow Index (MFI) is a momentum indicator that measures the flow of money into and out of a security over a specified period. It is related to the Relative Strength Index (RSI) but incorporates volume, whereas the RSI only considers the price. The MFI is calculated by accumulating positive and negative Money Flow values (see Money Flow), then creating a Money Ratio. The Money Ratio is then normalized into the MFI oscillator form. Oversold levels typically occur below 20, and overbought levels typically occur above 80.



The MFI line is well between the range. The signal is, therefore, neutral.

Simple Moving Average (SMA)

Month	Adj Closing Price	3SMA
Jun-22	2775.876	
22-Jul	3072.999	
22-Aug	3336.545	
22-Sep	3671.6	3061.807
22-Oct	3850.45	3360.381
22-Nov	3484.5	3619.532
22-Dec	3227.75	3668.85
23-Jan	3263.35	3520.9
Feb-23		3325.2
Mar-23		3272.1
Apr-23		3286.883
May-23		3294.728
Jun-23		3284.568

SECTION 3: DESIGNING OPTION TRADING STRATEGIES FOR THE GIVEN STOCK

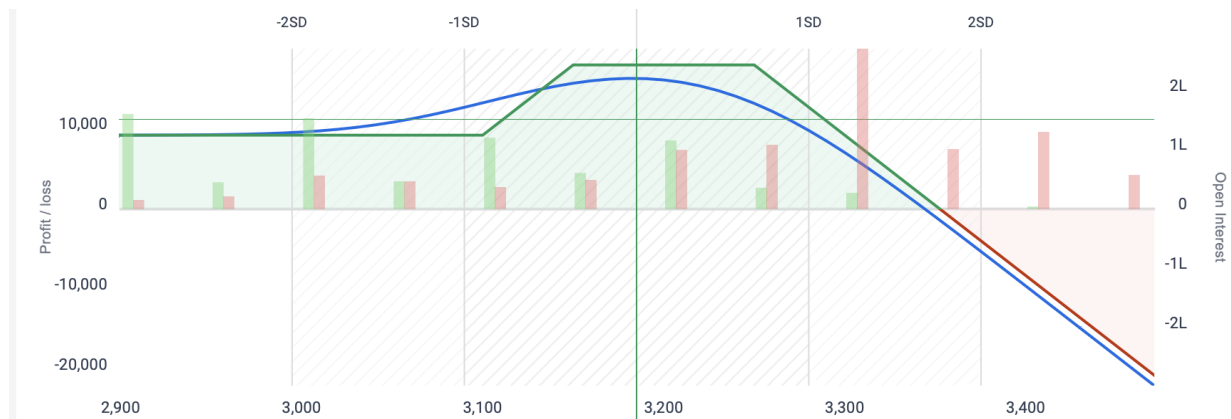
Jan 2023 - Feb 2023

For the month of February, keeping the expectations to be neutral but slightly bearish, we have used Reverse Jade Lizard strategy.

Strategy - Reverse Jade Lizard

Reverse jade Lizard is a slightly bearish strategy combining an out-of-the-money short call and an out-of-the-money bull put spread. When created properly, this strategy has no downside risk. It is best suited for overbought stocks with high implied volatility.

Type of investor - slight bearish speculator.



Reverse Jade Lizard				
25 Jan 2023 - 23 Feb 2023				
Option type	Strike Price	Premium		
short put	3150 (K1)	57.0 (P1)		
short call	3250 (K2)	85.5 (P2)		
long put	3100 (K3)	39.9 (P3)		
Pay Off Matrix				
	ST < K3	K3 < ST < K1	K1 < ST < K2	ST > K2
short put	ST - K1	ST - K1	0	0
short call	0	0	0	K2 - ST
long put	K3 - ST	0	0	0
Total payoff	K3 - K2	ST - K1	0	K2 - ST
Profit / Loss	K3 - K1 - (P1 + P2 + P3) 52.6	ST - K1 - (P1 + P2 + P3) ST - 3047.4	-(P1 + P2 + P3) 102.6	K2 - ST - (P1 + P2 + P3) 3352.6 - ST
Breakeven	ST = 3352.6			
Max profit	17955			
Max loss	Unlimited			

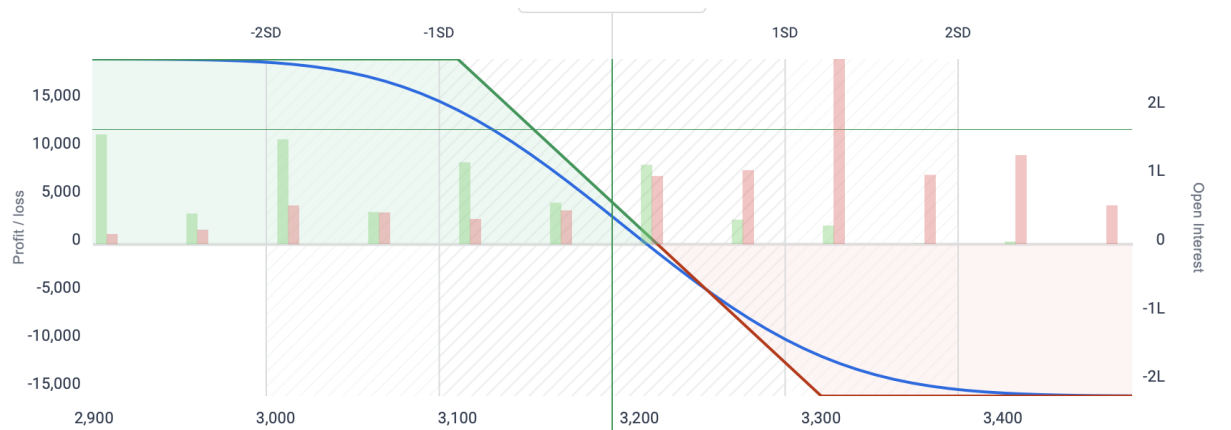
Jan 2023 - Mar 2023

For 2 months we have moderately bearish expectations so we have used a Bear call spread.

Strategy - Bear Call Spread

A bear call spread, or a bear call credit spread, is a type of options strategy used when an options trader expects a decline in the price of the underlying asset. A bear call spread is achieved by purchasing call options at a specific strike price while also selling the same number of calls with the same expiration date but at a lower strike price. The maximum profit to be gained using this strategy is equal to the credit received when initiating the trade.

Type of investor - Moderate risk taker with bearish expectations.



Bear Call Spread			
25 Jan 2023 - 29 Mar 2023			
Option type	Strike Price	Premium	
short call	3100 (K1)	363.8 (P1)	
long call	3300 (K2)	253.8 (P2)	
Pay Off Matrix			
	ST < K1	K1 < ST < K2	ST > K2
short call	0	K1 - ST	K1 - ST
long call	0	0	ST - K2
Total payoff	0	K1 - ST	K1 - K2
Profit / Loss	-(P1+P2)	K1 - ST - (P1+P2)	K1 - K2 -(P1+P2)
	110	3210 - ST	-90
Breakeven	ST = 3210		
Max profit	19250		
Max loss	-15750		

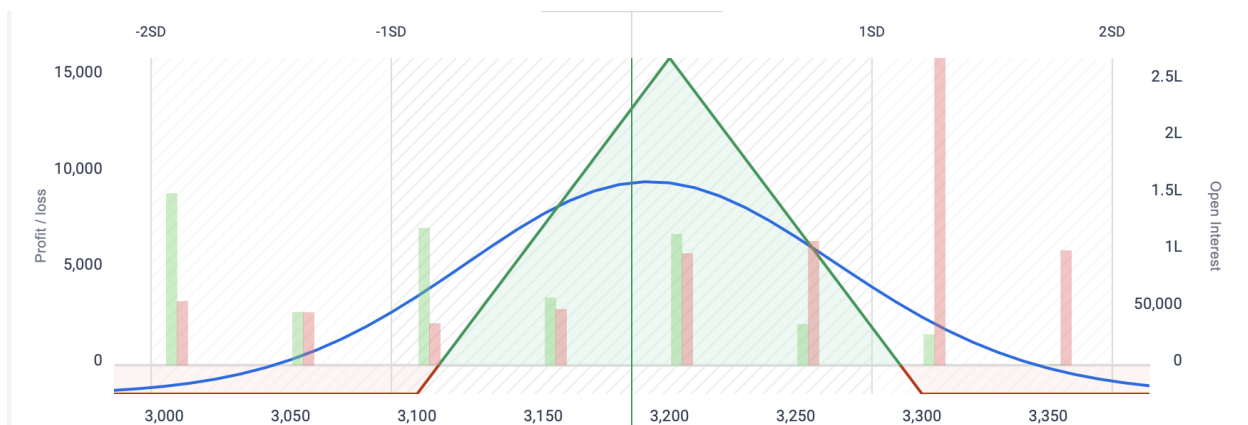
Jan 2023 - Apr 2023

As we do not expect much movement in the charts for three months we have used iron butterfly spread.

Strategy - Iron Butterfly Spread

The Iron Butterfly Option strategy, also called Ironfly, is a combination of four different kinds of option contracts, which together make one bull Call spread and bear Put spread. Together these spreads make a range to earn some profit with limited loss.

Type of investor - Non - directional speculator.



Iron butterfly Spread				
25 Jan 2023 - 27 Apr 2023				
Option type	Strike Price	Premium		
long put	3100 (K1)	147 (P1)		
short put	3200 (K2)	191 (P2)		
long call	3200 (K2)	213 (P3)		
short call	3300 (K3)	260 (P4)		
Pay Off Matrix				
	ST < K1	K1 < ST < K2	K2 < ST < K3	ST > K3
long put	K1 - ST	0	0	0
short put	ST - K2	ST - K2	0	0
long call	0	0	0	ST - K3
short call	0	0	K2 - ST	K2 - ST
Total payoff	K1 - K2	ST - K2	K2 - ST	K2 - K3
Profit / Loss	K1 - K2 - (P1+ P2+ P3+ P4) -9	ST - K2 - (P1+ P2+ P3+ P4) ST - 3109	K2 - ST - (P1+ P2+ P3+ P4) 3291 - ST	K2 - K3 - (P1+ P2+ P3+ P4) -9
Breakeven	ST = 3109			
	ST = 3291			
Max profit	16004			
Max loss	-1496			