

## Tesla Inc.(TSLA)

### MSF 505, Spring 2023

#### **Overview:**

Tesla, Inc. (TSLA) is a well-known electric vehicle manufacturer, energy storage company, and solar panel manufacturer. The company was founded in 2003 by Elon Musk, and it is headquartered in Palo Alto, California. Tesla's stock is listed on the NASDAQ exchange under the ticker symbol TSLA.

#### **Fundamental Analysis:**

Tesla's revenue has been increasing at a rapid pace over the past few years, with a revenue growth rate of over 50% year over year in 2021. The company's gross margins have also been improving steadily over the past few years, which is a positive sign for investors. Tesla's net income has been positive in recent years, although it has been somewhat volatile due to the company's heavy investment in research and development. Tesla's price-to-earnings (P/E) ratio is very high, which suggests that the stock is expensive relative to its earnings. However, Tesla's high P/E ratio may be justified by the company's growth prospects.

#### **Technical Analysis:**

In terms of technical analysis, Tesla's stock has been in a long-term uptrend since 2020. The stock has experienced some volatility in recent months, but it has been trading above its 50-day moving average most of the time. The stock's relative strength index (RSI) is currently in neutral territory, suggesting that the stock is not overbought or oversold.



(Chart Source: ETNA Trading platform)

#### **Long-Term Outlook:**

Tesla's long-term outlook is positive due to the company's strong growth prospects in the electric vehicle market. The company is well-positioned to benefit from the global trend towards electric vehicles, and it has a strong brand and loyal customer base. Tesla is also investing heavily in research and development, which should help the company to maintain its competitive edge in the EV market.

#### **Short-Term Outlook:**

Tesla's short-term outlook is more uncertain due to the recent volatility in the stock market. The company's stock has been affected by concerns about inflation and rising interest rates, as well as concerns about global supply chain disruptions. However, the company's strong financial performance and growth prospects should help to support the stock price over the long term.

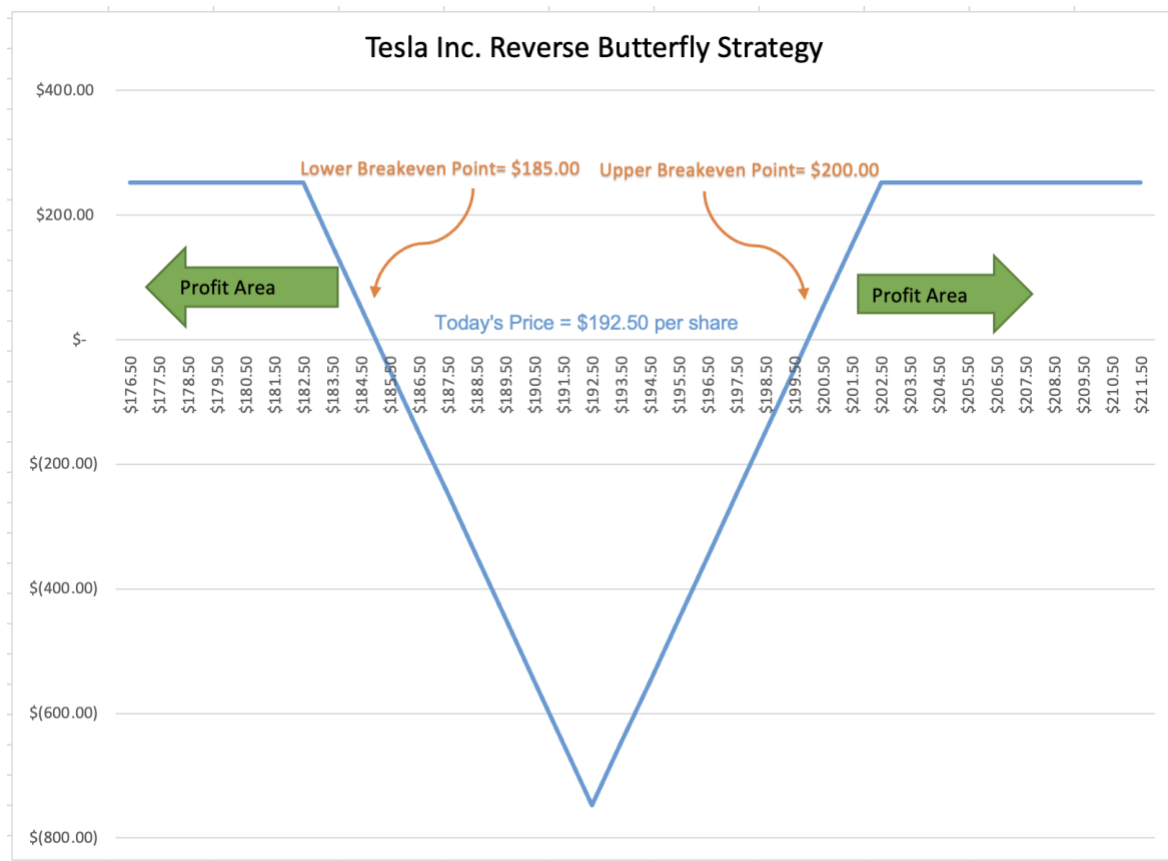
#### **Options Approach:**

The high volatility in the stock implies that the price movement in TSLA stock is uncertain in its direction of price movement. We should consider a spread that involves making profits from volatility.

### ***Recommendation:***

The recommended strategy is a “reverse butterfly or Inverted butterfly” spread. This spread strategy is appropriate for an investor who feels that a large underlying price movement is expected. This strategy will be profitable with high volatility in the stock. As per Tesla’s 6-month beta calculations in **Python (Annexures)**, we can see that the beta of Tesla is **1.79** which shows high volatility than SNP 500 index in recent times which is expected to replicate in the near future and may benefit short-term trade with the selected strategy.

### **Tesla Inc’s Reverse Butterfly / Inverse Butterfly Spread**



Position	Number of contracts	Strike price	Ask price	Premium
Short call (Exp April 14)	1	\$ 182.50	\$ 2.53	\$ 253.00
Long call (Exp April 14)	2	\$ 192.50	\$ 0.01	\$ 2.00
Short call (Exp April 14)	1	\$202.5	\$ 0.01	\$ 1.00
				\$ 252.00

Expiration Profits	Breakeven point
Short Calls	\$ 182.51
Long calls	\$ 192.49

Profits from squaring off all the option contracts =  $(2 \times 1.53 \times 100) - \$ 253$   
= \$ 53 Profit

### ***Post-Trade Analysis and Lessons Learned***

- In this reverse butterfly strategy, the short call's maximum profit potential was \$ 252 per contract however for long calls the maximum loss for 2 contracts was \$ 748. Overall, we had a profit of \$ 53 after deducting the premium loss and premium gained.
- The outcome of this profit illustrates that the short-term volatility calculations using Python yielded results.
- Timing is a very critical factor when it comes to executing and monitoring a complex trading strategy such as reverse butterfly spread. I had to constantly monitor the prices of options and keep track of my profitability.
- My Python research on short-term volatility helped in the risk management of this reverse butterfly spread. The stock perfectly replicated its past performance and with the help of historical data, I was able to make this short-term trade.
- Choosing this strategy was the best move since any other strategy in Tesla stock would have resulted in losses.
- On the last day of contract expiry(April 14), there was news about Tesla giving heavy discounts to its customers which resulted in high volatility leading in giving a good profit for our strategy. News article for reference - <https://www.reuters.com/business/autos-transportation/tesla-cuts-prices-model-3-model-y-vehicles-singapore-2023-04-14/>
- Overall, Tesla's strong growth prospects in the electric vehicle market make it an attractive investment for long-term investors. However, investors should be prepared for some volatility in the short term due to the current market conditions.

## Annexures

- Python code used to determine the short-term beta(Volatility) of Tesla stock

```
3
4
5 Created on Wed April 25 14:11:36 2023
6
7 @author: jaypatel
8
9
10 import yfinance as yf
11 import pandas as pd
12
13 # Get the data for Tesla stock
14 tesla = yf.download('TSLA', period='12mo', interval='1d')['Adj Close']
15
16 # Get the data for S&P 500 index
17 sp500 = yf.download('^GSPC', period='12mo', interval='1d')['Adj Close']
18
19 # Calculate the returns for Tesla stock and S&P 500 index
20 tesla_returns = tesla.pct_change()[1:]
21 sp500_returns = sp500.pct_change()[1:]
22
23 # Calculate the covariance and variance of the returns
24 covariance = tesla_returns.cov(sp500_returns)
25 variance = sp500_returns.var()
26
27 # Calculate the beta
28 beta = covariance / variance
29
30 print("Beta of Tesla stock for the last 6 months:", beta)
31
```

- The output of the above Python code:

```
In [4]: runfile('/Users/jaypatel/Desktop/untitled folder 2/Tsla.py', wdir='/Users/jaypatel/Desktop/untitled
folder 2')
[*****100%*****] 1 of 1 completed
[*****100%*****] 1 of 1 completed
Beta of Tesla stock for the last 6 months: 1.7976011428806395
```

- Fill Prices for the reverse butterfly spread on the ETNA System.

▼ TSLA Spread	04/04/2023 10:11:01	■ Filled	Day (Auto)	1	1
TSLA Apr 14 2023 W 182.50 Call	0.00	Sell To Open	-1	1	
TSLA Apr 14 2023 W 192.50 Call	0.00	Buy To Open	+2	2	
TSLA Apr 14 2023 W 202.50 Call	0.00	Sell To Open	-1	1	

- The below table shows the strike prices and profit areas at the time of settlement of the trades for a reverse butterfly spread on Tesla Inc stock.

S(t)	Payoff
\$ 176.50	\$ 252.00
\$ 177.50	\$ 252.00
\$ 178.50	\$ 252.00
\$ 179.50	\$ 252.00
\$ 180.50	\$ 252.00
\$ 181.50	\$ 252.00
\$ 182.50	\$ 252.00
\$ 183.50	\$ 152.00
\$ 184.50	\$ 52.00
\$ 185.50	\$ (48.00)
\$ 186.50	\$ (148.00)
\$ 187.50	\$ (248.00)
\$ 188.50	\$ (348.00)
\$ 189.50	\$ (448.00)
\$ 190.50	\$ (548.00)
\$ 191.50	\$ (648.00)
\$ 192.50	\$ (748.00)
\$ 193.50	\$ (648.00)
\$ 194.50	\$ (548.00)
\$ 195.50	\$ (448.00)
\$ 196.50	\$ (348.00)
\$ 197.50	\$ (248.00)
\$ 198.50	\$ (148.00)
\$ 199.50	\$ (48.00)
\$ 200.50	\$ 52.00
\$ 201.50	\$ 152.00
\$ 202.50	\$ 252.00
\$ 203.50	\$ 252.00
\$ 204.50	\$ 252.00
\$ 205.50	\$ 252.00
\$ 206.50	\$ 252.00
\$ 207.50	\$ 252.00
\$ 208.50	\$ 252.00
\$ 209.50	\$ 252.00
\$ 210.50	\$ 252.00
\$ 211.50	\$ 252.00

