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# An Analysis of Equity Derivatives in IT Sector

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***Abstract*: This study aims to compare the stocks of top market capitalization companies from the IT sector in the form of returns, volatility, Moving average, relative strength index. This is a basic concept not only in financial analysis but also helps the investors to predict the risk and return of using derivative instrument to investment.**

***Keywords*: Backwardization, Contango, Equity derivatives, IT sector, Moving average, Relative strength index.**

## 1. Introduction

Information Technology in India is an industry consisting of two major components: IT services and business process outsourcing (BPO). The sector has increased its contribution to India's GDP from 1.2% in 1998 to 7.7% in 2017. According to NASSCOM, the sector aggregated revenues of US$160 billion in 2017, with export revenue standing at US$99 billion and domestic revenue at US$48 billion, growing by over 13%. The United States accounts for two-thirds of India's IT services exports.

## 2. Review of Literature

Mohd Naved (2013) was conducted a study on "Technical Analysis of Indian Financial Market with the Help of Technical Indicators". The description of indicators which can be used for technical analysis of Indian Market Nifty stocks. The objective of the study was using technical indicators to (predict) the anticipate prices. Author used moving average convergence and divergence, simple moving average and exponential moving average. Technical analysis is a very subjective way of analysis with various variations available for the parameters used in Indicators of Technical Analysis. It is a rule based technique with little scope for personal judgment.

P. Karthika and dr. P. Karthikeyan (2013) was conducted study on "option investment strategy and their benefits- an analysis" author explaining types of options and comparing stock options, index options with indexes. Author's opinion is option contract investment provides Greater Cost Efficiency, Less Risk, and Higher Potential Returns to the investors. More Strategic Alternatives are available even in book profit in the volatile market.

Using Index or stock options strategically can considerably reduce the risk and potential loss of investing in stock. This can significantly increase your risk to reward ratio, and thereby profitability.

Narain (2011) was conducted study on "After Effects of Global Financial Crisis on Indian Derivatives Market" Author's study was about the crisis happened in 2008 and its effects in the stock market, particularly derivative market. Author admits somehow market can fluctuate but should at least have code of ethics. He discussed Indian cash market, debt market, derivative markets. Then he committed to comparing turnovers of exchanges between crisis periods, then comparing pre scene crisis and post crisis scene and how to adapt the market while happen crisis in future. He gave some strategies like hedging downside risk and short sale restriction. Studies focusing on the interaction of derivatives trading with spot market on aspects of lead-lag relationship, impact on liquidity, transfer of trading, etc. can now be justified to come up with robust conclusions. Such studies have been inconclusive so far in Indian contexts. A reasonable mix of the derivative products should provide a better alternative to the investors by supplementing the avenues for investment and risk management with the growing maturity of India's derivatives market.

## 3. Research Methodology

*Source of data:* The study is based on the secondary data collected from NSE. The leading stock's derivatives in the IT sector is collected and also sources such as magazines, newspaper and internet (www.moneycontrol.com) are used for the collection of data's. The data will be available in news papers, reports by management, websites, books, journals, etc. The monthly market prices are considered for the analysis in order to find out the short term fluctuations so that accuracy can be improved which helps in finding out accurate results. Long time data collection is difficult for derivative instruments.

*Sample Size:* The total number of stocks taken for the sample size is 5 which requires a detailed study and helps in predicting the results easily.

*Data collection method:* The Derivatives from the IT sector are chosen based on the top market capitalization in NSE. Simple random samples are taken for the collection of secondary data.

*Method of sampling:* Systematic sampling is used where the derivatives are taken in an orderly basis mentioned in the top market capitalization of stocks in the IT sector.

*Period of study:* The period of study covers from March 2020

to May 2020.

The following infrastructure companies are taken for the study.

| |
|---|
| TCS |
| HCLTECH |
| WIPRO |
| INFOSYS |
| TECHM |

## 4. Calculation

*Return*: The return is calculated based on the beginning and ending portfolio values. In this study the returns for each day is calculated for a period of 1 year and summed to get monthly returns.

Returns= [Closing stock price – opening stock price /opening stock price]

*Risk*: The fluctuations in price of a security or portfolio that happens beyond the investor's control and that affects the overall market is called as risk.

$$\beta = [\boldsymbol{n\Sigma XY} - (\boldsymbol{\Sigma x})/(\boldsymbol{\Sigma y})\ \boldsymbol{n\Sigma x2} - (\boldsymbol{\Sigma x})]$$

1) The negative returns show that the returns have gone down beyond the actual market price of the stocks, where the company or business faces lack lustre returns on investment.
2) The positive returns mean the business or the company enjoys profit and the efficiency of the investment will be higher.
3) When the company's shares remain idle without increase or decrease in the price of shares, it is soon going to face risk on negative returns.

*Variance*: Risk from an average can be measured by variance and this can help the investor during the purchase of securities. Standard deviation: Standard deviation measures the volatility of stocks by considering the stock's average returns.

*Moving average:* Predicting future prices based on average no of closing price.

*Relative strength index:* For relating closing price movements to know the equity's position, overbought or oversold, based on this derivative can be preferred. (put option) or (call option).

## 5. Analysis and Interpretation

### A. *Returns*

Table1
Returns of Infosys

| | |
|---|---|
| MARCH-2020 | 1.3% |
| APRIL-2020 | 6.5% |
| MAY-2020 | -1.3% |

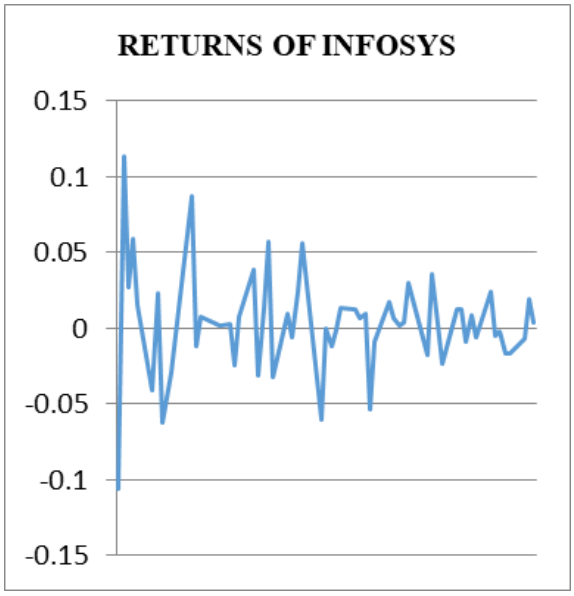


Fig. 1. Returns of Infosys

It is inferred above analysis that lowest returns of the stock in May 2020 -1.3%. and highest returns 6.5% on. April.

Table 2
Returns of HCLTECH

| | |
|---|---|
| MARCH-2020 | -2.0% |
| APRIL-2020 | 1.2% |
| MAY-2020 | 0.6% |

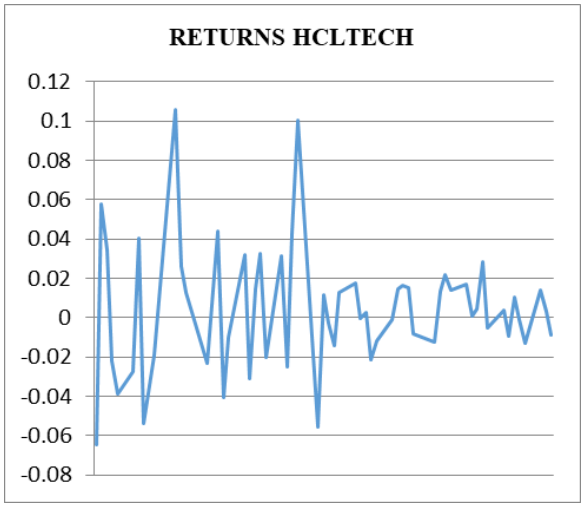


Fig. 2. Returns HCLTECH

It is inferred above analysis that lowest return HCLTECH is -2.0% during March -2020 and Highest return is 1.2% during April month.

Table 3
Returns of Wipro

| | |
|---|---|
| MARCH-2020 | 1.3% |
| APRIL-2020 | -1.6% |
| MAY-2020 | 0.6% |

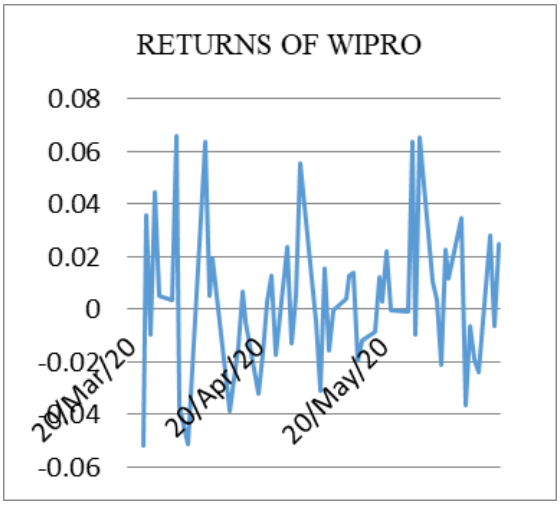


Fig. 3. Returns Wipro

It is inferred above analysis that lowest return of Wipro is –1.6% on Apr -2020 and Highest return is 1.2 % during March 2020.

Table 4
Returns of TECHM

| | |
|---|---|
| MARCH-2020 | -2.9% |
| APRIL-2020 | -1.5% |
| MAY-2020 | -1.9% |

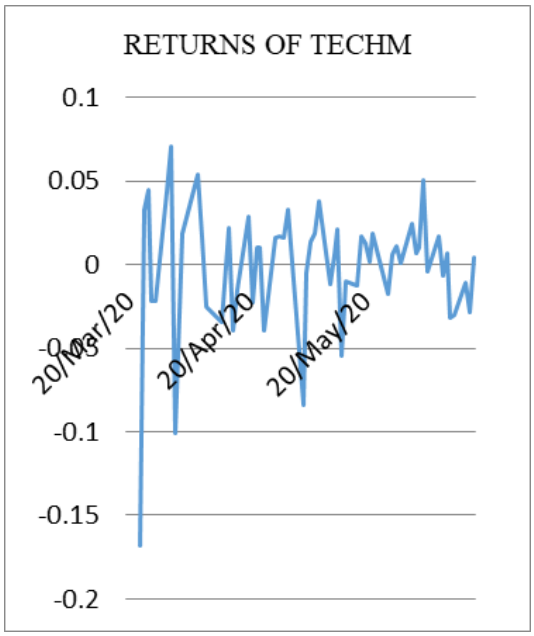


Fig. 4. Returns TECHM

It is inferred above analysis that lowest return of TechM is –2.7% during Mar -2020.

Table 5
Returns of TCS

| | |
|---|---|
| MARCH-2020 | 2.3% |
| APRIL-2020 | 5.5% |
| MAY-2020 | -2.2% |

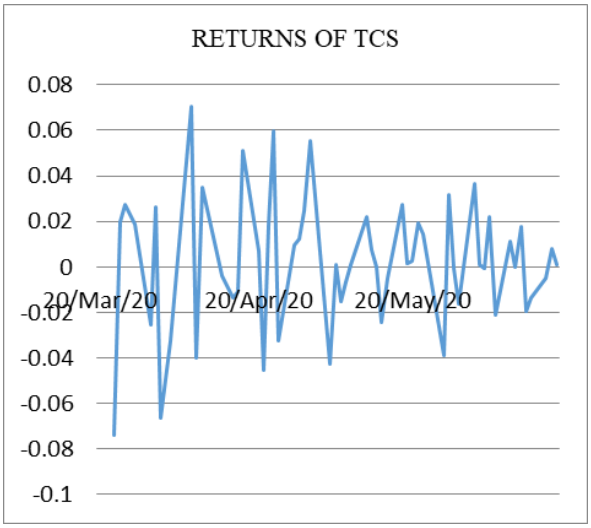


Fig. 5. Returns TCS

It is inferred above analysis that the lowest return of TCS is –2.2% at May -2020 and Highest return is 5.5% during April 2020.

*B. Daily volatility*

Table 6
Volatility of Infosys

| | |
|---|---|
| MARCH-2020 | 2.5% |
| APRIL-2020 | 3.5% |
| MAY-2020 | 4.65% |

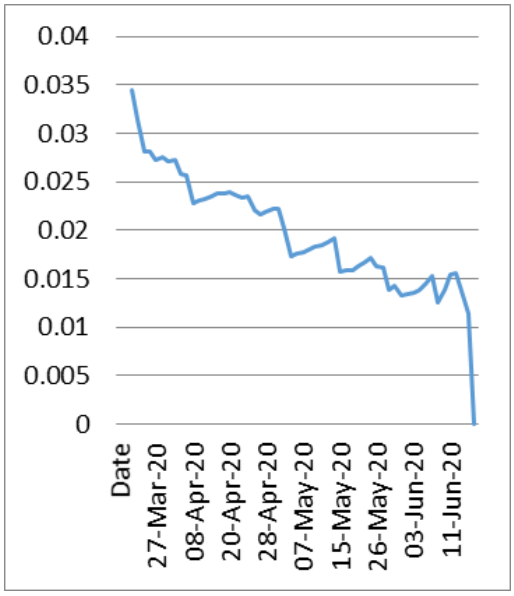


Fig. 6. Daily volatility of Infosys

It is inferred above analysis that highest risk of Infosys is 4.65 % on May-2020 and Lowest risk during March 2.5%

Table 7
Volatility of HCLTECH

| | |
|---|---|
| MARCH-2020 | 3.0% |
| APRIL-2020 | 2.5% |
| MAY-2020 | 0.4% |

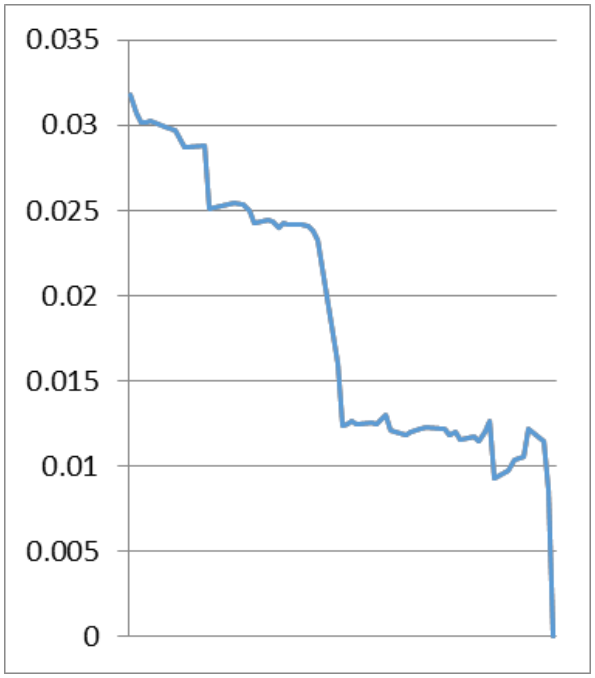


Fig. 7. Daily volatility HCLTECH

It is inferred above analysis that highest risk of the stock is 3% on Mar-2020 and Lowest risk on May 2020, 0.4%

Table 8
Volatility of TCS

| | |
|---|---|
| MARCH-2020 | 3.4% |
| APRIL-2020 | 2.75% |
| MAY-2020 | 1.5% |

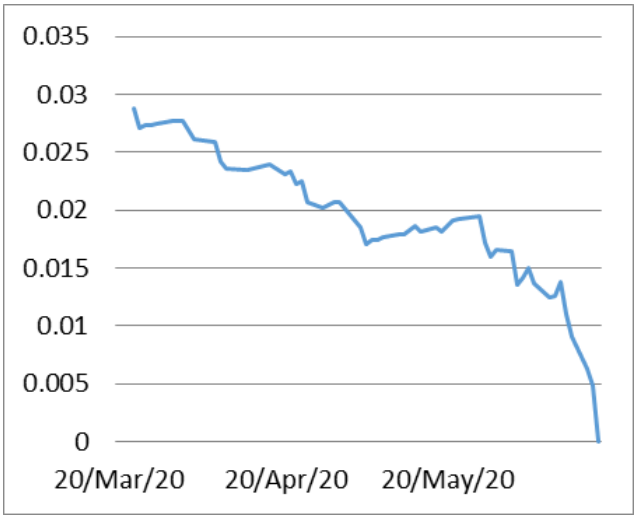


Fig. 8. Daily volatility of TCS

It is inferred above analysis that Highest risk of TCS is 3.4 % during Mar-2020 and lowest risk on May 2020, 1.5%.

Table 9
Volatility of TECHM

| | |
|---|---|
| MARCH-2020 | 2.6% |
| APRIL-2020 | -2.3% |
| MAY-2020 | -3.8% |

It is inferred above analysis that highest risk of TechM is 3.8 % during Mar-2020 and lowest risk is 2.3% during April month.

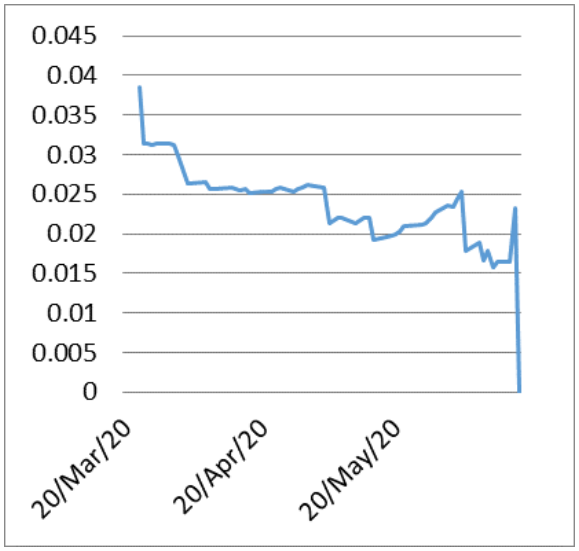


Fig. 9. Daily volatility of TECHM

Table 10
Volatility of Wipro

| | |
|---|---|
| MARCH-2020 | 2.2% |
| APRIL-2020 | 1.9% |
| MAY-2020 | 0.5% |

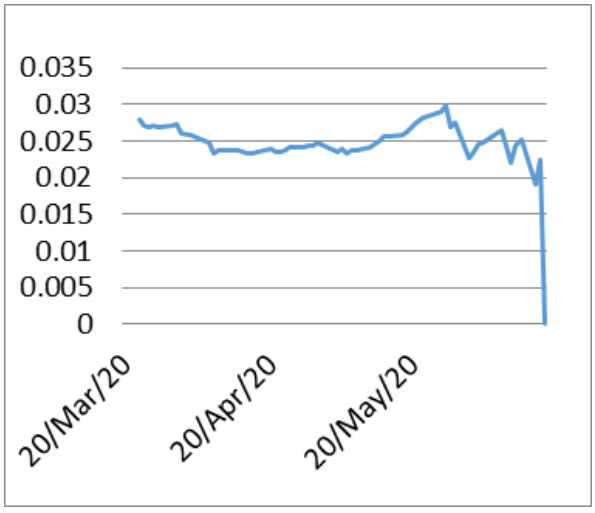


Fig. 10. Daily volatility of Wipro

It is inferred above analysis that. highest risk of Wipro is 2.20 % on Mar-2020. Lowest risk 0.5% during May 2020.

*C. Contango and Backwardization*

*Futures:*

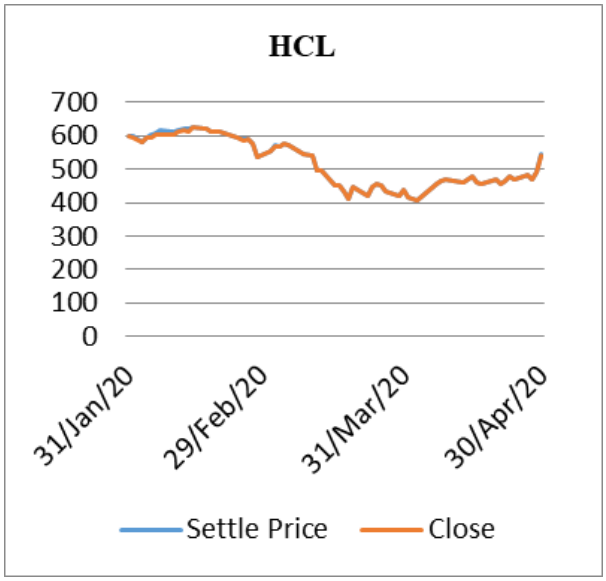


Fig. 11. HCLTECH futures

It is inferred above analysis that futures price of stock is higher than the spot price. It is contango position, so investors can buy or hold futures of the Hcltech.

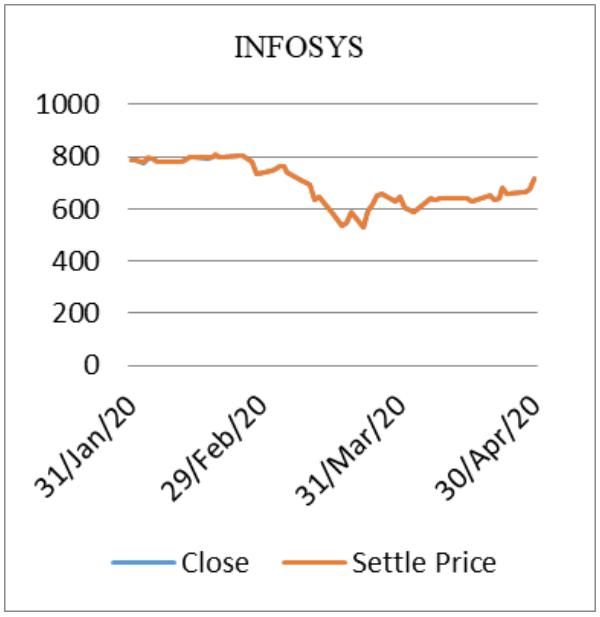


Fig. 12. Infosys futures

It is inferred above analysis that futures price of Infosys is higher than the spot price. It is contango position, so investors can buy or hold futures of the Infosys.

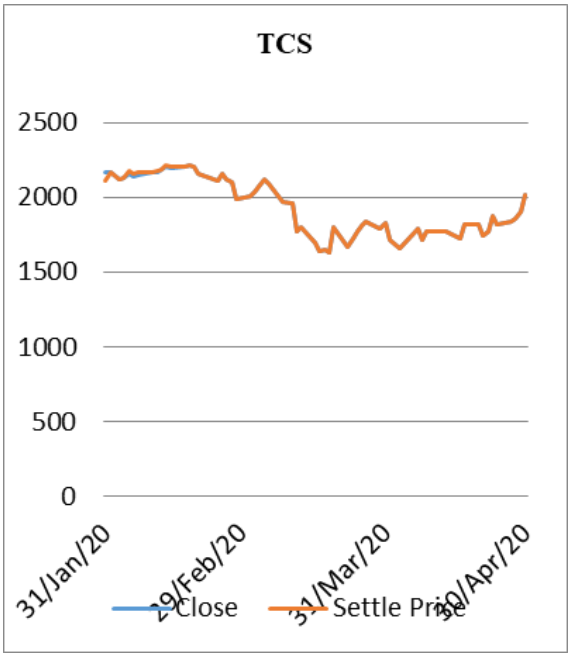


Fig. 13. TCS futures

It is inferred above analysis that futures price of TCS is higher than the spot price. It is contango position, so investors can buy or hold futures of the stock.

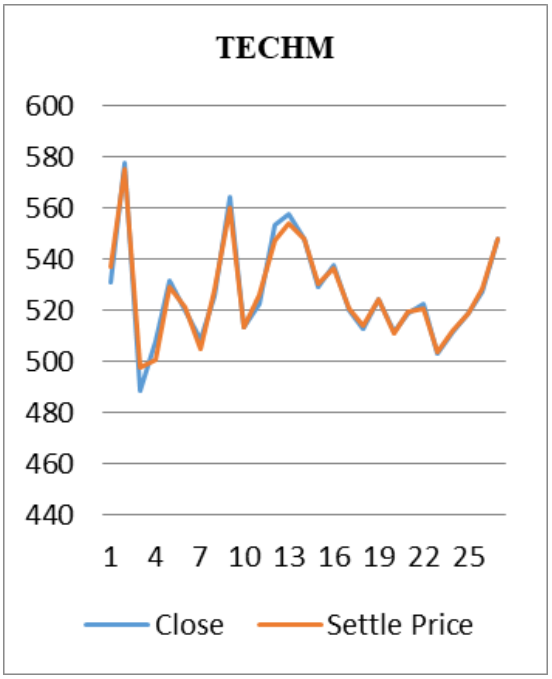


Fig. 14. TECHM futures

It is inferred above analysis that futures price of stock is higher than the spot price. It is contango position, So investors can buy or hold futures of TechM.

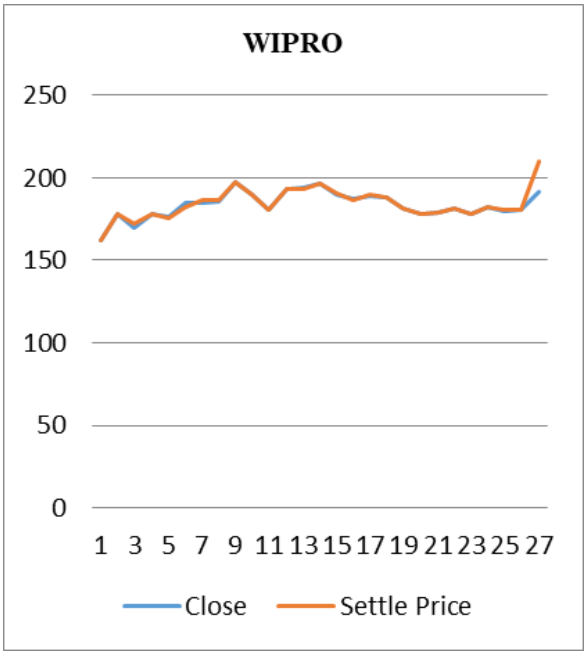


Fig. 15. Wipro futures

It is inferred above analysis that futures price of Wipro is higher than the spot price. It is contango position, so investors can buy or hold futures of Wipro.

*Put option:*

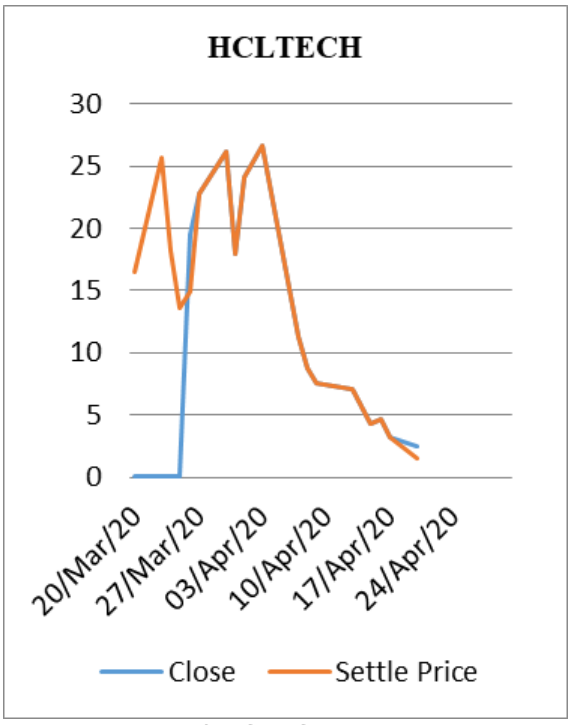


Fig. 16. HCLTECH Put option

It is inferred above analysis that future price of stock is lower than the spot price. Its backwardization position, so investors can sell their put option of Hcltech.

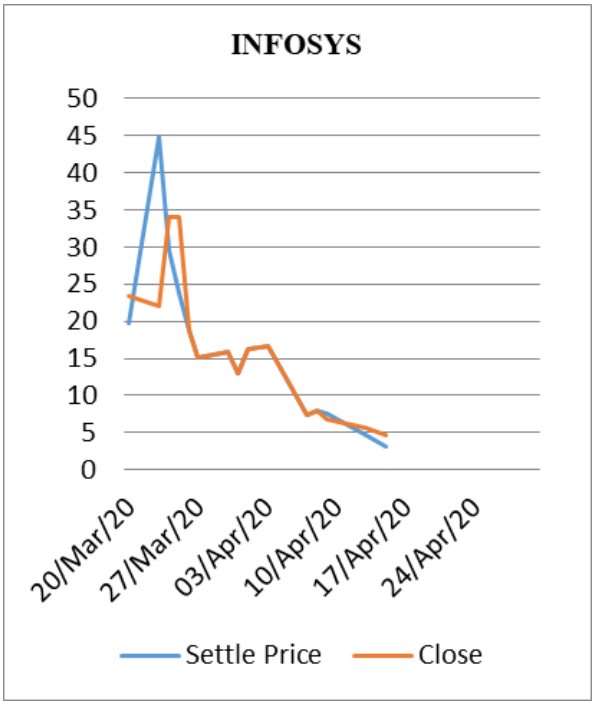


Fig. 17. Infosys Put option

It is inferred above analysis that future price of Infosys is lower than the spot price. Its backwardization position, so investors can sell their put option of Infosys

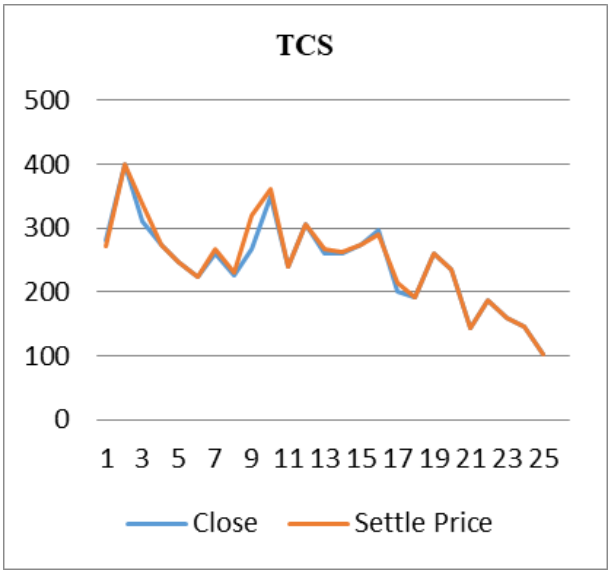


Fig. 18. TCS Put option

It is inferred above analysis that future price of TCS is lower than the spot price. Its backwardization position, So investors can sell their put option of TCS.

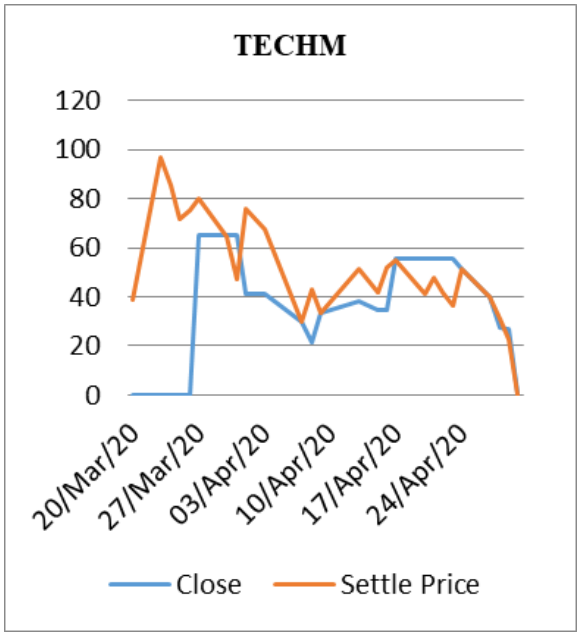


Fig. 19. TECHM Put option

It is inferred above analysis that future price of stock is lower than the spot price. Its backwardization position, so investors can sell their put option of TechM.

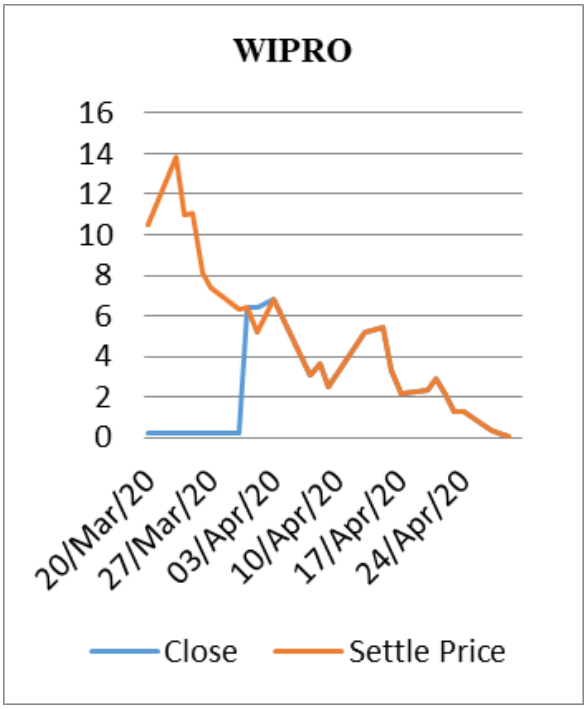


Fig. 20. Wipro Put option

It is inferred above analysis that future price of Wipro is lower than the spot price. Its backwardization position, so investors can sell their put option of Wipro.

*Call option:*

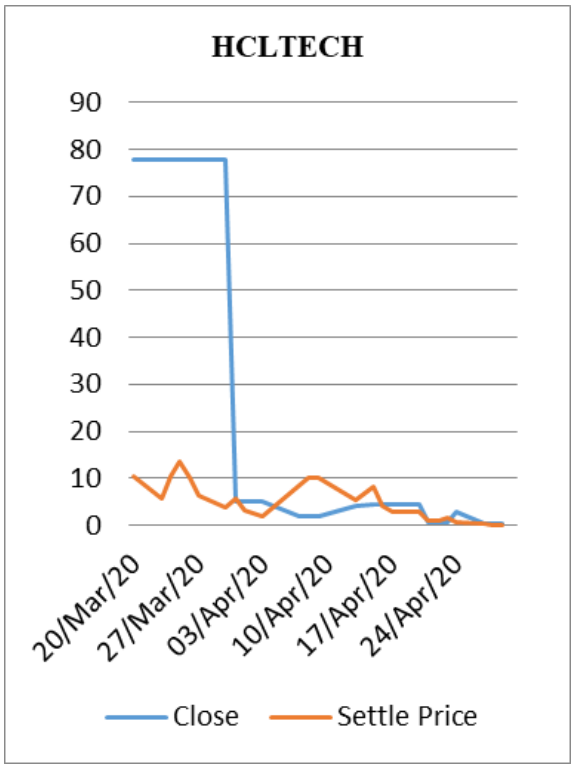


Fig. 21. HCLTECH call option

It is inferred above analysis that future price of Hcltech is lower than the spot price. Its backwardization position, So investors can sell their Call option.

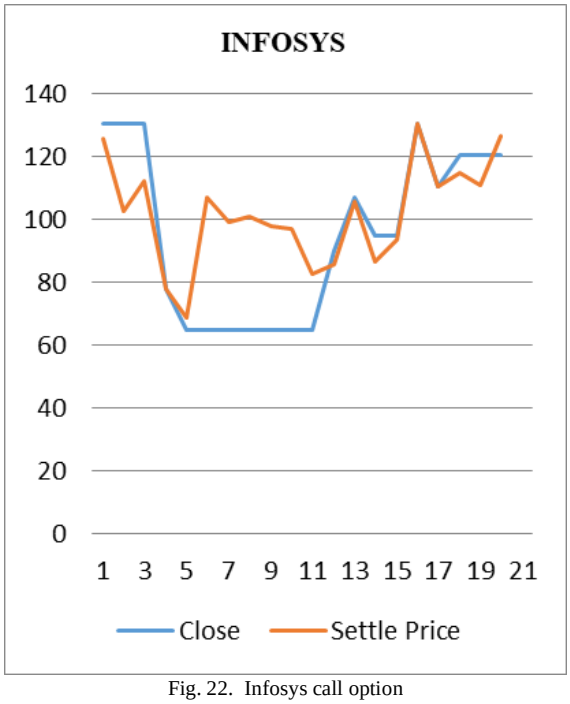


Fig. 22. Infosys call option

It is inferred above analysis that futures price of Infosys is

higher than the spot price. It is contangoposition, So investors can buy or hold call option.

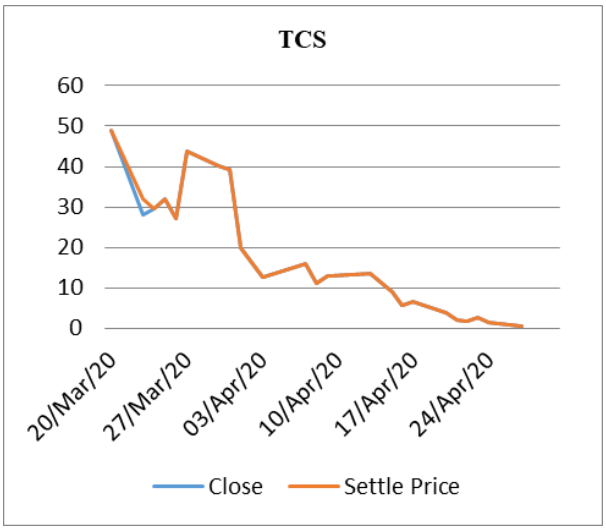


Fig. 23. TCS call option

It is inferred above analysis that future price of TCS is lower than the spot price. Its backwardization position, So investors can sell their Call option.

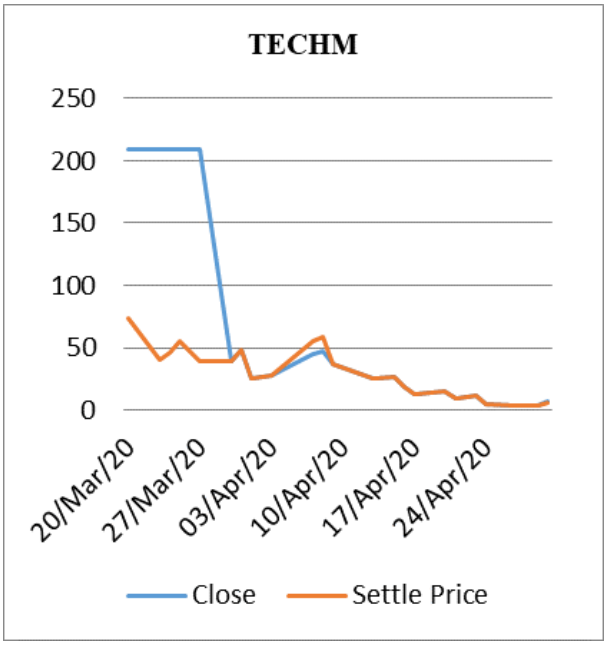


Fig. 24. TECHM Call option

It is inferred above analysis that future price of TechM is lower than the spot price. Its backwardization position, So investors can sell their Call option of TechM.

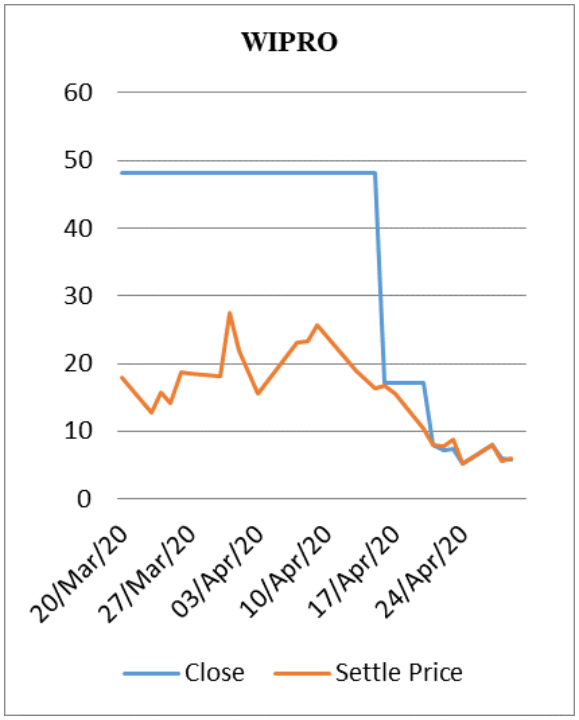


Fig. 25. Wipro Call option

It is inferred above analysis that future price of Wipro is lower than the spot price. Its backwardization position, So investors can sell their Call option.

*Moving average analysis:*

Here, Analysing derivatives are under certain periods, time period of premium expiry was 3 months, so we took 5 day moving average and 10 day moving average to determine the values.

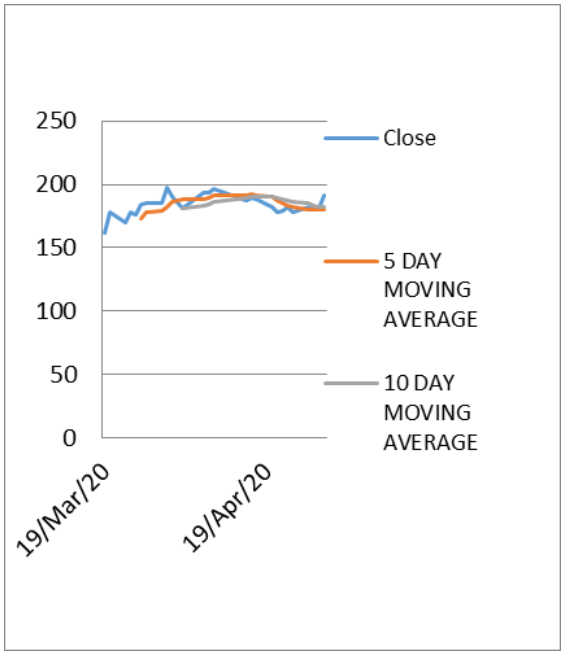


Fig. 26. Moving average of Wipro

From above analysis 10th day average crossed 5th day average at end of the April, it suggests future prices are would rise and investors can buy futures of Wipro and call option.

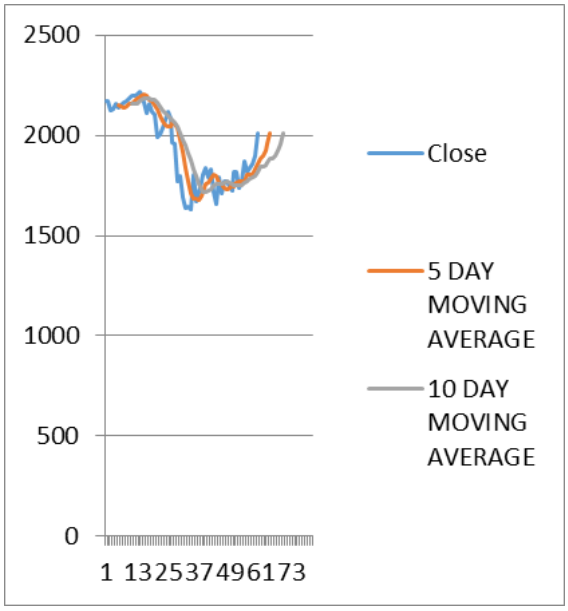


Fig. 27. Moving average of TCS

From above analysis 10th day average crossed 5th day average at end of the April, it suggests future prices are would rise and investors can buy futures of TCS and call option. We have seen volatile in call option of TCS contango & backwardization charts, so investors should short straddle strategy.

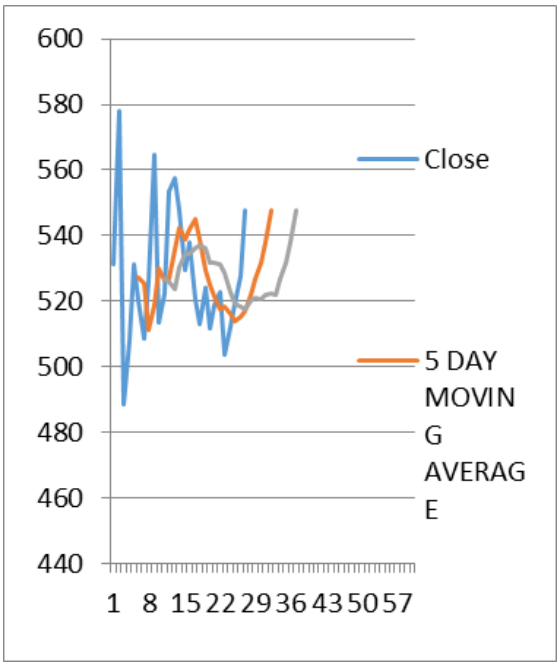


Fig. 28. Moving average of TECHM

Here, Those Three lines are raised after the struggle, It's like merely a comeback for /TECHM, we have seen a very worst situation (covid-19) impacts the worst position of TECHM, but moving average suggests there is hope for this company. Anyhow investors have to think twice, if they want TECHM do strategy like buying both call and put mitigate the risk with one another. But there is a hope for comeback.

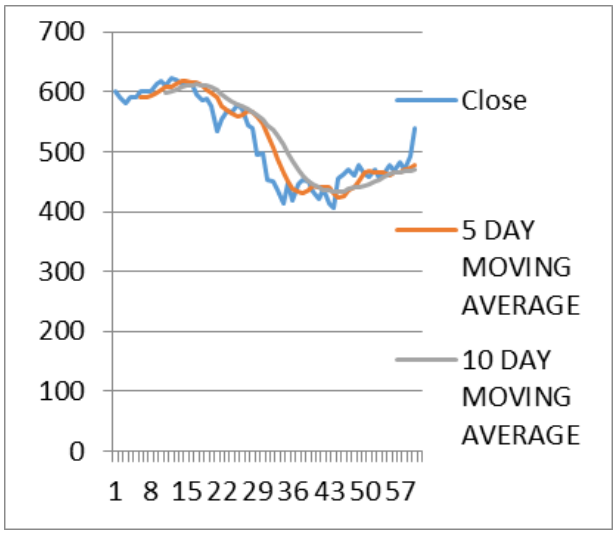


Fig. 29. Moving average of HCLTECH

The above chart is a curious one, because saw the last momentum 5th day average crosses the 10th day average, in future the price may fall or rise, but in short term HCLTECH is under bear position based on moving average. So investors can buy puts and keep update their analysis.

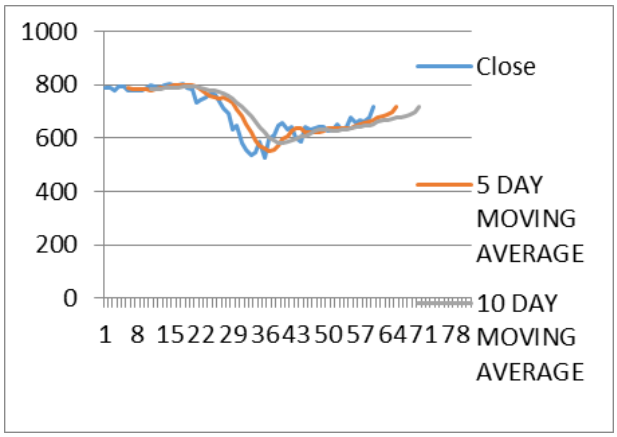


Fig. 30. Moving average of Infosys

Infosys is having a good faith in the investors hands, because Infosys got a way through nice plots like these 5th and 10th day averages are together moving towards the comeback, we have seen the futures and call option of contango & backwardization Infosys got a contango position, graph also shows the same. Investors can buy a call premium of Infy and futures also suggested but may very careful, market anytime crash.

*Relative strength index:*

RSI analysis is made to know the position of the company. Position like overbought and over sold, it suggest the demand for the company share through that investors can buy derivative.

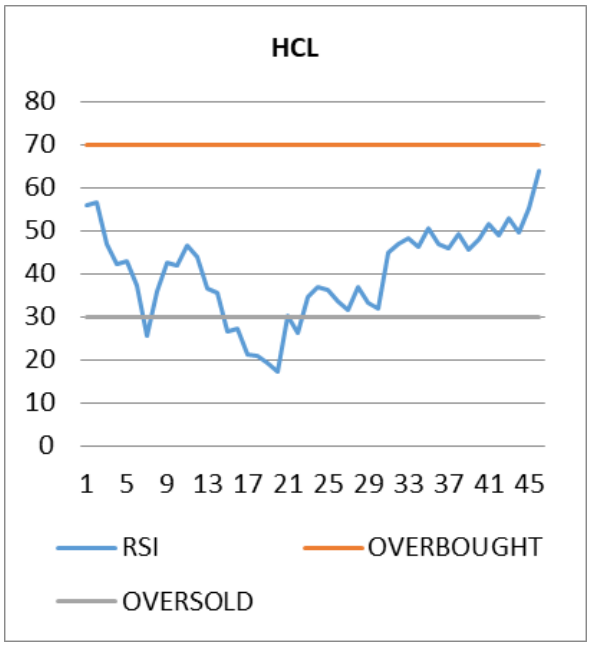


Fig. 31. RSI of HCLTECH

Graph shows that march 2020 to April 1st week for nearly under over sold, then people are started to buying aggressively, finally it reaches 64, whenever it can be overbought position. So investors have to avoid call option is better. But puts gives some values. RSI=64.03.

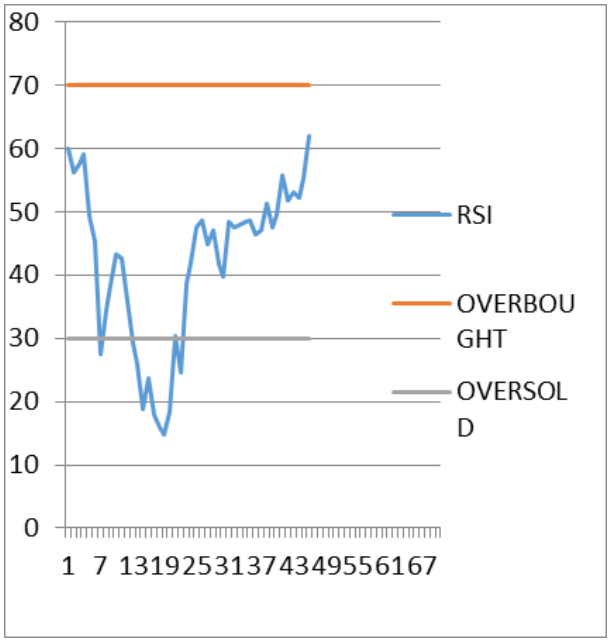


Fig. 32. RSI of Infosys

Above graph shows that march 2020 to April 1st week to oversold, then people are started to buying aggressively, finally it reaches 62, whenever it can be overbought position. so investors have to avoid call option is better. But Infosys have a good record in other analysis, so let's watch the company then invest. RSI=61.9.

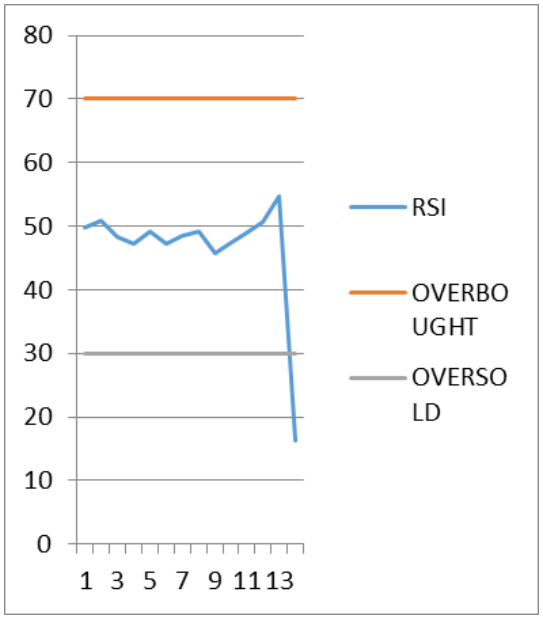


Fig. 33. RSI of TECHM

This chart shows there is drastic fall towards oversold position. A sudden fall is an immediate short selling happened in the market at end of April 2020. In here there is no prediction to future demand, investors reactions are considered after some weeks, This scrip is more volatile and investor behaviours would also very volatile. Technically Put option is very worthy for TECHM. RSI=16.26.

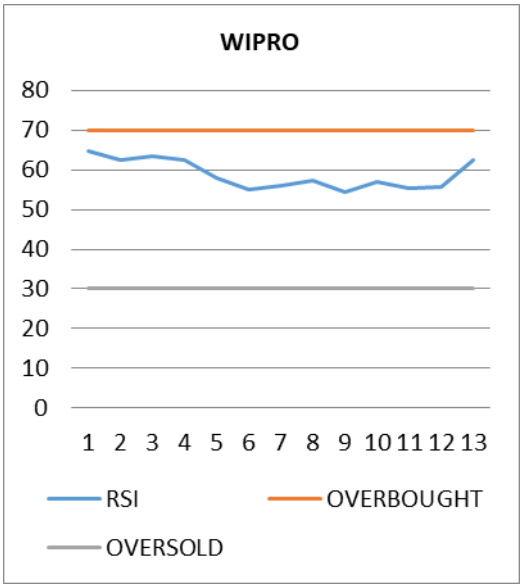


Fig. 34. RSI of Wipro

In this graph Wipro towards overbought position. Wipro had a good position in moving average analysis, it proves investors are tend to buy. But that are up to certain levels then future price would started fall. RSI=62.55

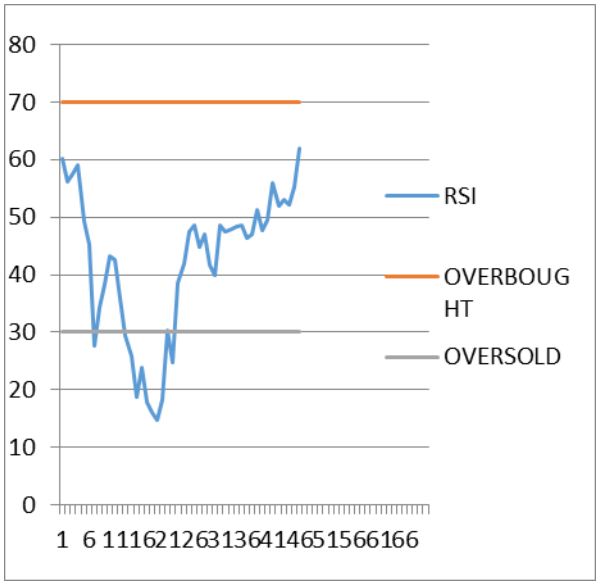


Fig. 35. RSI of TCS

From above analysis shows that march 2020 to April 1st week towards oversold, then afterwards people are tend to buy that stock. Whenever it can be overbought position. so investors have to avoid call option is better. But Infosys have a good record in other analysis, so let's watch the company then invest.RSI=62.25

## 6. Conclusion

From all of the analysis are have certain restrictions and aim. Every analysis gives results based on the time period only, in these kind of market(covid-19), like crisis or downtrend put option will be preferred, or investors can buy both options called Long straddle strategy and selling both options i.e., short straddle strategy. In this time investors can make a long term investment in shares, but in derivatives perspective, It's the market can make book huge profits and losses, because volatility is everything when entering derivatives. So, Kindly Investors not only make decisions based on technical wise, do other factors also.

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