



Alpha Derivatives

# FINAL REPORT

Phase 2: Summer Internship Project

**PART-1**

Profile of the Organization

**PART-2**

Project Work

**PART-3**

Learnings



## SUMMER INTERNSHIP PROGRAMME 2020

Final Report on

Project: **Derivative Research and Data Analytics**

Company: **Alpha Derivatives**



Address: 1st Floor, U B Building, 106, 109, SV Rd, Malad West, Mumbai, Maharashtra

Authored By:

Prabhjot Kaur  
(191134)

Prepared For:

- Institute of Management, Nirma University  
- Alpha Derivatives

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Prof. Balakrishnan Unny

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## **Executive Summary**

The Final Report on Summer Internship project is divided into three broad categories viz. profile of the Alpha Derivatives (the organization where we completed the internship), Project work done during the internship and finally the learnings based on the project work done.

The organization, Alpha Derivatives is in the financial services industry and is centered at developing trading mechanism across different asset classes with the help of deep quantitative research work. They are also involved in corporate training projects.

The project work done during the internship started with the training to understand the basics of derivatives market. Then based on that training, analysis of the Derivatives data, mainly focused on futures and options, was to be carried out to predict the future trends that the particular stock will follow. This was done to find the profitable investment opportunities by doing traded in F&O data. The analysis was done on weekly and monthly basis with the help of data available on NSE website.

Finally, the learnings in the form of knowledge and skills acquired during the project are mentioned.

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# **PART- A**

## **PROFILE OF THE ORGANIZATION**

### **1.1 About the Organization:**

Alpha Derivatives is a multi-asset class derivative trading strategy developing firm. It develops various strategies across the assets class including Equities, Currencies, Commodities and other alternative asset classes.

### **1.2 Vision:**

“To utilize our expertise in designing contemporary training modules through research for effecting wider market participation amongst the masses who have less access to the financial markets but have the inclination to do so.”  
- Alpha Derivatives

### **1.3 Products & Services:**

- Alpha Derivatives develops strategies across the assets class including Equities, Currencies, Interest Rate futures, Commodities and other alternative asset classes.
- Mentor the traders and analysts who have newly entered in the financial markets with the help of scientifically designed approaches of their experienced traders and mentors.
- Also involved in Corporate Training and conduct workshops in various B-schools. These workshops are based on financial assets and their analysis.

### **1.4 Customers:**

Following forms the customer base of Alpha Derivatives:

- a) Individual Traders (for getting consultancy services)
- b) B-school students
- c) New traders and analysts (to acquire knowledge of Derivatives data)

## 1.5 SWOT analysis

### **STRENGTHS**

1) Qualified and Professional staff:

The founders of Alpha Derivatives, Ritesh Chavan and Jay Savla, are expert in the field of Derivative Trading. They have expertise in equity research, derivative research, and capital research. They are qualified professionals having work experience in the currency and commodity trading based firms.

2) Strategic partnership:

Alpha Derivatives have collaborated with “Money Work Here”, working in the domain of investment banking. Its business includes sourcing, manufacturing, developing, managing and marketing alternative investment products. These products include Hedge Funds, Private equity, Real estate funds, Venture capital, wealth products, and much more.

3) Vertically diversified business:

Main business of Alpha Derivative is derivative research and development of trading strategies. But apart from this, it is also involved in assets analysis, mentoring and corporate training which has helped them in diversifying their business.

4) Centralized operations:

All the powers and responsibilities are centralized in the hands of co-founders, which provides them more control over its operations. This helps in quick decision making and better quality of work.

5) Pre-developed Resources for Interns:

The resources to train interns are already developed and can be used infinite times for training which help them in time saving and ensuring equality in content distribution.

6) Multi-asset class:

The firm’s strategies are not limited to a single asset. It is used over multiple asset classes including Equity, Derivatives, Commodity, Currency, and other alternative asset classes.

7) Easily available data:

The data required for research work is easily and freely available on BSE (Bombay Stock Exchange) and NSE (National Stock Exchange) websites. They do not have to pay to get any data required for the training and research work.

## **WEAKNESSES**

1) Less brand recognition:

As the firm has started its operations in 2019, it is still in its startup stage. The firm is known locally and, in few cities, and colleges, where the sessions are conducted by the founders of Alpha Derivatives. As the firm has just started, so it does not enjoy the brand recognition and is not much known as compared to its competitors.

2) Less diversified:

The firm has started growing. The founders have expanded it in the domain of derivative research, mentoring, corporate training and analysis of asset classes. But it is very small as compared to its competitors. Major financial services firms are well diversified and has opened many subsidiaries. So, alpha derivatives is small and less diversified as compared to them.

3) Small team:

The firm is started by two founders which are the permanent staff of the organization. Apart from that, there is temporary staff which mainly consist of interns. So, the firm is mainly run by the founders

4) Distribution network is not well established:

The firm is growing its distribution network by conducting seminars in different colleges, providing internship and live project opportunities to students, consulting, etc. But this network is very small yet and needs to be developed.

## **OPPORTUNITIES**

1) High scope of expansion:

As the business of the firm is still in the start up stage, the firm has a lot of opportunities to expand and diversify its business by entering into different segments of financial services. It can focus on expanding its customer base as well.

2) Participation by all class of investors:

In financial markets, all class of investors, such as, retail investors, corporates, institutions, high net worth individuals, among others participate. So, company can start attracting small investors for their training and consultation services and then gradually move to higher levels.

3) Leveraging technology:



Technology is upgrading in each and every industry. In financial services sector, many up to date software are used to form best strategies and it also reduces the manual work. The firm can also optimize its work and strategies by putting technology to its best use.

4) Youth's inclination:

Today's youth is taking interest in learning about financial markets to get a secondary source of income, following as a hobby or other reasons. Even youth from rural segment is also taking interest in it. All of them require mentors to guide them and this can be used as an opportunity to expand the customer base.

## **THREATS**

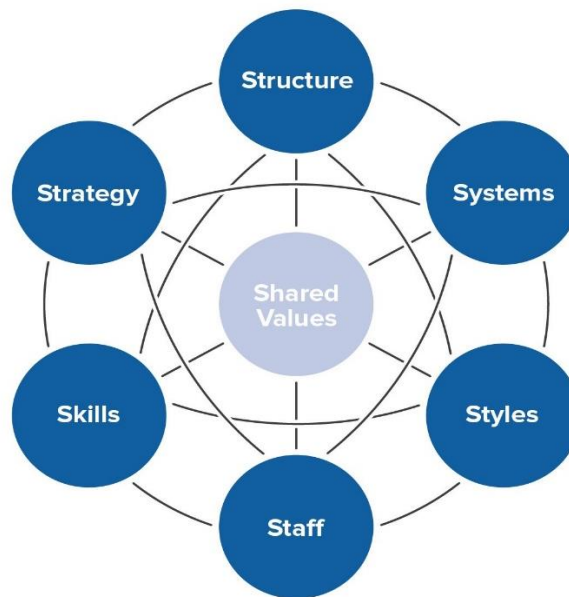
1) Unfavorable economic condition:

Markets are majorly influenced by the economy. If economic condition of a country is not good, then markets of that country won't perform better. There are many Market crashes that has happened in past. And currently, the Covid 19 pandemic has also lead to the market crash. Such situations pose serious threat to the business of the firm, as the investors would also reduce.

2) Increased intensity of competition from local and global players:

Alpha derivative is facing high indirect competition from major financial services firm working in the domain of derivative strategy. These firm are very big, well diversified and have large customer base. So, they give intense competition to the firm and can be a serious threat for the firm.

## **1.6 7 S Framework:**



### 1) Strategy

Alpha Derivatives is a startup. It was established in 2019. The strategy adopted by the company to expand its customer base is through formulation of various trading strategies and then publishing them on their websites. They provide on-site projects and internship opportunities in the field of derivative research, which also helps them develop strategies for various titles and spread their commercial awareness. They also offer corporate training and college seminars.

### 2) Structure

The structure of the company is horizontal. It has only two levels of hierarchy. The first level has its founders. Ritesh Chavan is one of the founders of the company. The second level is made up of support staff and interns. These employees and students report their work to the company's founders. Company revenue is based on on-site transactions and consultancy and projects provided to students at a certain cost. Its founders are responsible for marketing and generating content for various projects.

### 3) System

Alpha Derivatives is a multi-asset class derivative strategy development company. It uses the "Trade Tiger" software provided by ShareKhan for trading. Employees conduct daily futures and options analysis through BhavCopy available on NSE website and formulate strategies for negotiating futures contracts and options. The company is relatively small, so there are no big costs.

4) Shared values

The mentor and staff are very helpful. They always encourage work beyond the normal range, deepening the data and exploring the facts. Insist on data collection through verified resources, so the results generated through research done is almost perfect. Interns are free to ask questions, which demonstrates their open attitude towards students. They also openly accept the opinions of employees and interns on various strategies, which shows that they respect each other's ideas and share common values.

5) Skills

The team of strategy developers and traders has all the skills and work experience necessary to do the assigned tasks. The company's founders also have a high level of programming knowledge that can help them analyze market data effectively and profitably.

6) Style

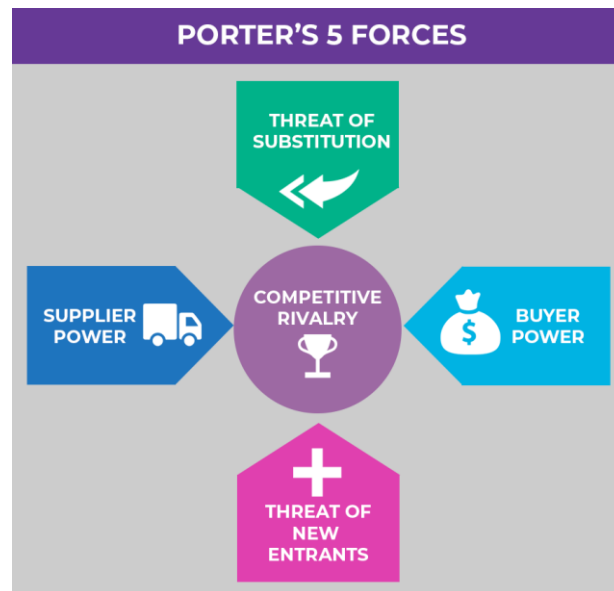
The company's working style is flexible. They provide the appropriate time to complete the tasks and provide individual guidance via email and WhatsApp when needed. They pay more attention to the quality of the work than to the quantity. While mentoring, they also encourage interns to participate and raise questions, whenever they find problem. They also offer opportunities to express ideas and therefore direct our thought process in the right direction.

7) Staff

Alpha Derivatives is a growing company, so it currently has 2 to 10 employees. Employees are composed of ambitious people who work hard for the development of the company. The company does not discriminate during recruitment. They believe that the person should have the right skills and attitude to complete the allotted task.

## **1.7 Porter's 5 Forces Model:**

Porter's 5 Forces is a tool by which the marketers and business managers try to find how is the power balanced among the market players on a global level and it helps in identifying the attractiveness and potential profitability in an industry sector.



### **Competitive Rivalry:**

Alpha Derivatives is primarily involved in **Derivative Research and Data Analytics** and the competitive rivalry is moderate as there are enough companies that are involved in this domain. The main players which provide direct competition to Alpha Derivatives are **The Money Roller, Motilal Oswal Financial Services Ltd., Money Sukh** etc. These are independent firms which use their research models to formulate profit making trading strategies and publish them in the market. There are some big investment management companies also such **Yes Securities, Kotak Securities, India Bulls Ventures Limited, CRISIL** etc. which are involved in derivative research. They conduct these researches to facilitate their clients in order to make their investments grow. Given the number of potential clients and the diversity of their needs, there is **level of differentiation** which eases competitive pressure.

### **Threat of substitute products:**

As there are many companies that are involved in Derivative Research and Analysis for the clients that have high net-worth or institutional investors. They can avail the services of any

research or investment management firm. But as far as Alpha Derivatives is concerned there are **no real substitutes** available as the domain is very niche and everyone adopts the tools and the research methodology according to their own discretion.

### Bargaining power of buyers:

The bargaining power of clients depends upon the level of differentiation in the research. In case of derivatives they have the higher power as there are **low switching costs** and the market is **fragmented**.

In this case the cost of research is low as compared to the risk taken by the capital clients by putting a huge amount. Losing a client is manageable as the buy-side market is very much fragmented.

### Threat of New Entrants:

There are very few or negligible number of barriers to entry which makes the threat of new completion very high. The reasons behind this are:

- There is very low capital requirement, no significant regulatory barriers.
- Switching costs are low and there is no need of a location or a distribution channel.

Also, it is difficult to replicate the manner in which a research firm gathers, analyse and interprets the data and firms in this particular research domain has trusted clients relationship and are also equipped with specialized knowledge and experience which makes these the only strongest barrier.

### Bargaining Power of Suppliers:

The most significant suppliers are the analysts or the associates. Although their services are critical to every research firm but their skills are normally transferable. Their bargaining power is limited to:

- Labour costs is the major contributor to the overall total costs of a research firm which makes the price a sensitive issue.
- There is a good amount of talented labour available in the market.

## Part B

### PROJECT WORK

#### 2.1 Introduction:

- Information/ Nature of Problem:

The research problem here is to study and analyse historical F&O data, such as open contracts, base / premium or discount, share prices, volumes, changes in contracts open over time, etc., in order to determine the derivative data pattern in various situations. Through the use of Excel and analysing these patterns, trading strategies are formulated to determine the price trend of the underlying securities in future.

- Objective of the Study:

The main purpose of the study is to study data on derivatives and develop profitable derivatives trading strategies through collaborative efforts of mentor and intern, to predict the future price trends and to maximise the success rate of predictions done about the future price trends.

The secondary objectives will include a range of advanced skills regarding data analytics and an understanding of the derivatives market by those who undertake the project.

- Utility of the Study:

This study would help to find a way to predict future trends based on derivatives data with more precision and higher success rate. This would also help to find the best tools and techniques to analyse the data so that the success rate of predictions could be increased. The strategy developed through this study would be in the form of a report which can be referred by other traders to gain knowledge regarding the analysis of derivatives data.

#### 2.2 Methodology:

- Approach:

The research approach is quantitative and qualitative as it involves analysis of numbers and figures of derivatives data presented in excel and then arriving at conclusions and generating observations with the help of the analysis of that historical data. Finally, finding the ways to analyse the data so that the success rate of predictions of future trends could be increased.

- Sources of Data:

All the data sources are secondary as the data is already available on the websites. These sources are: website of Bombay Stock Exchange (BSE) and National Stock Exchange and investing.com.

- Method of Data Collection:

The method of data collection was through **documents and records** that are updated daily on the website of NSE. It mainly involves the data of Bhavcopy of each day, having open, high, low and close prices of the underlying asset as well as futures and options contracts, Open interest, change in open interest, etc. The data related to the price trends is also gathered from the investing.com website presented there in the form of candle stick, line and bar charts.

- Size of Samples and Method of Sampling

In this research, samples are collected randomly having a total of around 150 stocks forming the population. Then based on the filters, a sample of 10-15 stocks was selected for doing the analysis and getting inferences.

- Method of Data Analysis:

Both **quantitative and qualitative analysis** of data is done. Firstly, quantitative analysis of derivatives data is done with the help of excel formulas and using financial functions. All this is done after applying filters on that data. All this quantitative analysis helped in generating Bullish/ Bearish projections related to the stocks. Later, the qualitative analysis is done by comparing the positions generated with the help of quantitative analysis with the real price trends available through charts of that stock.

### **2.3 Context of Industry Problem:**

The problem was the dynamic market and the pricing of the securities that change every second and with every market event. So, predicting these price trends and finding a profit-making point was required, which is done with the help of compiling data in such a way that inferences can be drawn from it. And finally, to analyse that data using different parameters related to options and futures contracts.

## 2.4 Presentations of Data

**Figure1**

This is the raw data collected from the BhavCopy available on NSE website.

INSTRUMENT	SYMBOL	EXPIRY_DT	OPTION_TYP	OPEN	HIGH	LOW	CLOSE	SETTLE_PR	CONTRACTS	VAL_INLAKH	OPEN_INT	CHG_IN_OI
FUTSTK	ACC	30-Jul-20	XX	1332.85	1340.5	1320.1	1331.45	1331.45	3121	20777.38	2251000	38500
FUTSTK	ACC	27-Aug-20	XX	1335.1	1340	1324.85	1335.2	1335.2	24	160.09	15000	500
FUTSTK	ACC	24-Sep-20	XX	0	0	0	1265.8	1341.9	0	0	0	0
FUTSTK	ADANIEN	30-Jul-20	XX	158.85	161	156.2	159.15	159.15	1170	7429.61	18836000	196000
FUTSTK	ADANIEN	27-Aug-20	XX	160.35	160.35	158.25	158.25	159.25	2	12.74	60000	0
FUTSTK	ADANIEN	24-Sep-20	XX	0	0	0	163.55	159.75	0	0	0	0
FUTSTK	ADANIPOI	30-Jul-20	XX	345.85	349.45	345.15	347.95	347.95	884	7676.85	29460000	85000
FUTSTK	ADANIPOI	27-Aug-20	XX	347	348.85	346.6	348.85	348.85	9	78.21	102500	5000
FUTSTK	ADANIPOI	24-Sep-20	XX	0	0	0	341	350.2	0	0	2500	0
FUTSTK	AMARAJA	30-Jul-20	XX	664.7	685.85	658.7	683.6	683.6	1844	12411.76	1766000	-97000
FUTSTK	AMARAJA	27-Aug-20	XX	660.2	668	660.2	668	688.1	2	13.28	12000	0
FUTSTK	AMARAJA	24-Sep-20	XX	0	0	0	647.8	690.35	0	0	0	0
FUTSTK	AMBUJAC	30-Jul-20	XX	193.15	196.7	192.55	194.35	194.35	1313	7660.86	18861000	303000
FUTSTK	AMBUJAC	27-Aug-20	XX	196.1	196.4	193.95	194	194.95	9	52.52	99000	9000
FUTSTK	AMBUJAC	24-Sep-20	XX	0	0	0	188.45	195.6	0	0	0	0
FUTSTK	APOLLOH	30-Jul-20	XX	1321.55	1367	1321.55	1363.15	1363.15	3248	21975.08	1245000	-178000
FUTSTK	APOLLOH	27-Aug-20	XX	1344.95	1365	1344	1363.05	1363.05	36	243.2	27500	-5000
FUTSTK	APOLLOH	24-Sep-20	XX	1342.9	1342.9	1342.9	1342.9	1375.95	1	6.71	2000	500
FUTSTK	APOLLTY	30-Jul-20	XX	110.4	111.9	110.2	111.35	111.35	1047	5821.16	10070000	105000
FUTSTK	APOLLTY	27-Aug-20	XX	111.2	111.4	110.15	111.2	111.6	19	105.31	215000	-5000

**Figure 2**

After the quantitative analysis the following heads are calculated:

- % Change in Open Interest
- Future Weighted Price
- Basis
- % Basis
- % Change in Basis
- Position
- % Change in Underlying

And following heads are taken directly from the raw data:

- Open Interest
- Underlying Price
- Change in Open interest
- Previous Underlying price



Symbol	Open Interest	Change in OI	% Change in OI	Fut Wtd price	Underlying price	Basis	% basis	Previous underlying	Previous basis	% Previous basis	% Change in basis	Position	% change in underlying
TORNTPHARM	3,82,500	86500	29.22%	1921.49	1933.65	-12.16	-0.63%	1890.5	-5.291	-0.28%	129.75%	bullish	2.282%
HEXAWARE	14,28,000	268500	23.16%	328.3	326.5	1.80	0.55%	336	1.150	0.34%	56.52%	bullish	-2.827%
BIOCON	1,14,21,100	13,49,300	13.40%	285.005	285.7	-0.70	-0.24%	285.8	-0.772	-0.27%	9.95%	bullish	-0.035%
RECLTD	2,10,54,000	23,34,000	12.47%	131.393	130.75	0.64	0.49%	137.9	0.295	0.21%	117.75%	bullish	-5.185%
BAJAJ-AUTO	24,86,750	2,29,000	10.14%	3268.55	3259.75	8.80	0.27%	3159.25	17.766	0.56%	-50.45%	bearish	3.181%
KOTAKBANK	82,55,200	6,70,000	8.83%	1653.65	1646.75	6.90	0.42%	1633	0.236	0.01%	2823.36%	bullish	0.842%
JUBLFOOD	21,66,000	1,61,000	8.03%	1584.26	1578.35	5.91	0.37%	1594.6	1.562	0.10%	278.56%	bullish	-1.019%
TATASTEEL	2,08,26,433	14,78,044	7.64%	401.231	399.65	1.58	0.40%	420.85	1.426	0.34%	10.84%	bullish	-5.037%
MFSL	78,67,500	5,47,800	7.48%	529.507	526.85	2.66	0.50%	506.1	3.906	0.77%	-31.99%	bearish	4.100%
BHEL	4,59,30,400	30,13,200	7.02%	50.2585	50	0.26	0.52%	51.2	0.306	0.60%	-15.62%	bearish	-2.344%
UNIONBANK	2,79,16,000	16,80,000	6.40%	59.35	59.2	0.15	0.25%	62.35	0.300	0.48%	-50.00%	bearish	-5.052%
CESC	12,45,600	67200	5.70%	736.431	732.95	3.48	0.47%	745.55	1.408	0.19%	147.31%	bullish	-1.690%
YESBANK	26,21,25,600	1,31,05,400	5.26%	56.0968	59.5	-3.40	-5.72%	64.05	-1.589	-2.48%	-114.22%	bearish	-7.104%
APOLLOHOSP	15,23,000	73000	5.03%	1405.67	1404.4	1.27	0.09%	1416.25	7.930	0.56%	-84.00%	bearish	-0.837%
COALINDIA	1,33,76,100	6,33,500	4.97%	202.618	205.6	-2.98	-1.45%	205.85	-0.949	-0.46%	-214.28%	bearish	-0.121%
SAIL	7,74,23,800	34,93,000	4.72%	38.1519	38.05	0.10	0.27%	39.5	0.154	0.39%	-33.64%	bearish	-3.671%
NIITTECH	4,81,875	19875	4.30%	1453.53	1446.4	7.13	0.49%	1462.1	3.283	0.22%	117.14%	bullish	-1.074%
MINDTREE	12,68,200	50600	4.16%	719.731	717.1	2.63	0.37%	705.25	1.516	0.21%	73.58%	bullish	1.680%
TORNTPOWER	49,89,000	1,98,000	4.13%	272.525	271.25	1.28	0.47%	277	1.426	0.51%	-10.57%	bearish	-2.076%

After compilation and quantitative analysis using formulas, this qualitative analysis of each stock is done using the data of each stock for a particular week. (5 sample stocks are presented as sample below).

Figure 3: Escorts Limited

Date	SYMBOL	Open Interest	Change in OI	% change in OI	Fut Wtd price	Underlying price	Basis	% basis	prev. underlying	prev. basis	% prev. basis	% change in basis	Position	% change in underlying
30-Jun	ESCORTS	28,20,400	50600	1.83%	1038.65	1040	-1.349	-0.13%	1033.45	1.036	0.10%	-230.27%	bearish	0.634%
01-Jul	ESCORTS	26,74,100	-146300	-5.19%	1033.661	1033.85	-0.188	-0.02%	1040	-1.349	-0.13%	86.03%	sideways to bullish	-0.591%
02-Jul	ESCORTS	25,99,300	-74800	-2.80%	1042.669	1040.75	1.919	0.18%	1033.85	-0.188	-0.02%	1117.53%	sideways to bullish	0.667%
03-Jul	ESCORTS	28,28,100	228800	8.80%	1062.946	1059.9	3.046	0.29%	1040.75	1.919	0.18%	58.75%	Bullish	1.840%

### Trend predicted: BULLISH

Over the last 3 days, from 1<sup>st</sup> July to 3<sup>rd</sup> July, basis have gone from -1.349 to 3.046. This increased basis points towards the Bullish Position.

On 1<sup>st</sup> and 2<sup>nd</sup> July, almost **8% of the positions have closed** and basis have increased, which points towards the **end of bearish trend**.

On 3<sup>rd</sup> July, the OI has increased by 8.8% with a 58.75% change in basis, indicating towards the **open-buy criteria** and bullish trend.

Through stock graph, it is visible that the stock is already following a bullish trend, so this trend would be followed further.

**Figure 4 Divi's Laboratories Limited**

Date	SYMBOL	Open Interest	Change in OI	% change in OI	Fut Wtd price	Underlying price	Basis	% basis	prev. underlying	prev. basis	% prev. basis	% change in basis	Position	% change in underlying
30-Jun	DIVISLAB	34,02,800	77200	2.32%	2276.774	2278.9	-2.126	-0.09%	2316.6	1.860284	0.08%	-214.26%	bearish	-1.627%
01-Jul	DIVISLAB	34,52,800	50000	1.47%	2248.538	2241.25	7.287	0.33%	2278.9	-2.12559	-0.09%	442.85%	bullish	-1.652%
02-Jul	DIVISLAB	41,52,000	699200	20.25%	2207.613	2196.65	10.963	0.50%	2241.25	7.28757	0.33%	50.44%	bullish	-1.990%
03-Jul	DIVISLAB	44,66,800	314800	7.58%	2197.8	2190.45	7.34987	0.34%	2196.65	10.96338	0.50%	-32.96%	bearish	-0.282%

**Trend predicted: BULLISH**

In 2 days (1<sup>st</sup> and 2<sup>nd</sup> July), the **basis increased** from **-2.125 to 10.963**, which forms the 0.50% of the underlying.

Most of the positions (**20% OI change**) has been opened on 2<sup>nd</sup> July and the basis touched 10.963 points, which is a **contango** situation and points towards the buying behaviour.

On 3<sup>rd</sup> July, the basis reduced but the change is not that significant as compared to the increased basis over 2 days. The basis has only reduced by 32.96% which is not significant when compared to the **442.85% change in basis** on 1<sup>st</sup> July in the positive direction.

So, the overall position is pointing towards a bullish trend.

By looking at the chart, we observed that the stock has already fallen a lot and that bearish trend has been ended. So, bullish trend is expected.

**Figure 5 Tata Consultancy Services Limited**

Date	SYMBOL	Open Interest	Change in OI	% change in OI	Fut Wtd price	Underlying price	Basis	% basis	prev. underlying	prev. basis	% prev. basis	% change in basis	Position	% change in underlying
30-Jun	TCS	85,13,400	-254400	-2.90%	2078.296	2082.15	-3.854	-0.19%	2101.65	-11.975	-0.57%	67.82%	sideways to bullish	-0.928%
01-Jul	TCS	82,65,000	-248400	-2.92%	2089.792	2092.05	-2.258	-0.11%	2082.15	-3.854	-0.19%	41.41%	sideways to bullish	0.475%
02-Jul	TCS	84,72,300	207300	2.51%	2147.183	2157.15	-9.967	-0.46%	2092.05	-2.258	-0.11%	-341.36%	bearish	3.112%
03-Jul	TCS	89,15,700	443400	5.23%	2183.74	2199.65	-15.909	-0.72%	2157.15	-9.967	-0.46%	-59.62%	bearish	1.970%

**Trend predicted: BEARISH**

If we observe the basis, then the stock is in backwardation. The stock tried to reduce the negative basis and reached to -2.258 from -11.975 basis. But on 3<sup>rd</sup> July it again went to **negative 15.909**, which forms **0.72% of the underlying** and is significant.

With this **backwardation** situation, the OI is increasing and the **overall positions opened** with negative basis is around **7.5%** of the total positions (combining 2<sup>nd</sup> and 3<sup>rd</sup> July figures). This is pointing towards bearish trend.

The closed positions on 30<sup>th</sup> June and 1<sup>st</sup> July is not considered because positions closed with respect to the total open positions is not significant (it is around 3% on each day).

The graph of TCS shows that that the stock is already following a bullish trend and this trend is expected to finish soon as the stock has already jumped a lot. So, the bearish trend is expected as per above analysis.

**Figure 6: Mahindra & Mahindra Financial Services Limited**

Date	SYMBOL	Open Interest	Change in OI	% change in OI	Fut Wtd price	Underlying price	Basis	% basis	prev. underlying	prev. basis	% prev. basis	% change in basis	Position	% change in underlying
30-Jun	M&MFIN	10472700	-6,21,600	-5.603%	166.86	167.8	-0.940	-0.560%	168.80	0.31	0.18%	-406.34%	sideways to bearish	-0.592%
01-Jul	M&MFIN	12276600	1803900	17.225%	173.75	173.30	0.452	0.261%	167.80	-0.94	-0.56%	148.10%	bullish	3.28%
02-Jul	M&MFIN	13857900	15,81,300	12.881%	185.71	184.9	0.814	0.440%	173.30	0.45	0.26%	79.89%	bullish	6.694%
03-Jul	M&MFIN	13437900	-4,20,000	-3.031%	182.89	182.75	0.141	0.077%	184.90	0.81	0.44%	-82.64%	sideways to bearish	-1.163%

### **Trend predicted: BULLISH**

The positions opened on 1<sup>st</sup> and 2<sup>nd</sup> July form a significant % of open interest and showing a bullish position.

The basis change is positive and significant as it was forming 0.44% of the underlying on 2<sup>nd</sup> July. So, both the OI change and basis change on 1<sup>st</sup> and 2<sup>nd</sup> July are pointing towards a bullish trend.

The positions closed are not that significant as compared to the positions opened. So, not considered them.

As per the graph the trend is bullish but movement is small. This small movement is visible in the terms of basis as well. So, the stock is expected to follow this bullish trend.

**Figure 7: Motherson Sumi Systems Limited**

Date	SYMBOL	Open Interest	Change in OI	% change in OI	Fut Wtd price	Underlying price	Basis	% basis	prev. underlying	prev. basis	% prev. basis	% change in basis	Position	% change in underlying
30-Jun	MOTHERSUMI	2,42,76,000	1043000	4.49%	94.70023	94.65	0.050	0.05%	95.3	-0.057	-0.06%	187.93%	bullish	-0.682%
01-Jul	MOTHERSUMI	2,61,10,000	1834000	7.55%	97.54717	97.1	0.447	0.46%	94.65	0.050	0.05%	790.24%	bullish	2.588%
02-Jul	MOTHERSUMI	3,81,92,000	12082000	46.27%	104.1972	103.65	0.547	0.53%	97.1	0.447	0.46%	22.37%	bullish	6.746%
03-Jul	MOTHERSUMI	3,28,23,000	-5369000	-14.06%	97.85351	98.1	-0.246	-0.25%	103.65	0.547	0.53%	-145.04%	sideways to bearish	-5.355%

**Trend predicted: BULLISH**

The stock is showing a bullish position from 3 days (30<sup>th</sup> June to 2<sup>nd</sup> July) and the basis was increasing continuously over that period which pointed towards the bullish trend.

Here as the underlying price is less, so the basis figures would be less. But as the % basis is around 0.50%, it would be considered significant.

The important aspect of this stock is that 46.27% positions have been opened on a single day, i.e. on 2<sup>nd</sup> July and the basis has increased, indicating a strong bullish trend.

On 3<sup>rd</sup> July 14% of the positions closed which lead to decrease in basis, but the opened positions are much more, so a trend is expected.

The graph shows that the stock is moving sideways and will break that trend according to the analysis.

## **2.5 Analysis & Discussion**

For analysing the data, a sheet was prepared where the comparison was done between the data of two consecutive dates. This data involves the following:

- 1) Symbol: Nomenclature used for stocks.
- 2) Open Interest (OI): This refers to the total open positions of a particular stock
- 3) Change in Open Interest: The increase or decrease in open interest with respect to the previous day.
- 4) Percentage change in Open Interest:  
$$\% \text{ change in OI} = \frac{\text{Change in OI}}{\text{Open interest}}$$
- 5) Future Weighted Price: There are three future prices based on 3 expiry dates of the future contracts. So, future weighted price was calculated on the basis of Weights of OI.
- 6) Underlying price: This is the current price of the stock in spot market.
- 7) Basis: This is the difference between Future weighted price and Underlying price.
- 8) Percentage Basis:  $\text{Basis} / \text{Underlying price}$
- 9) Previous basis and previous underlying price, % previous basis: This involves the data of previous day.
- 10) Percentage change in basis:  $(\text{Basis} - \text{previous basis}) / \text{previous basis}$
- 11) Position: there are 4 positions in the data which is calculated with the help of nested if formula
  - a) Bullish: We will get the bullish position when **both OI and basis will increase**. OI increase will show that more positions are opening, i.e. a greater number of contracts of that stock are being bought. Increase in basis shows that the future price is increasing with compared to the underlying price, as the demand of the stock's future contract is increasing and they are buying the future's contract at higher prices.
  - b) Bearish: We will get the bearish position when OI will increase but basis will decrease. OI increase shows more positions being opened and basis decrease shows the nature of the positions which is bearish.
  - c) Sideways to Bearish: We get this position when OI will decrease and basis will decrease. OI decrease will show that the positions are closing, i.e. the stock's future contracts are selling more.

d) Sideways to Bullish: This position comes when OI will decrease and Basis will increase.

12) % Change in Underlying:

(Underlying price- previous underlying price)/ Previous underlying price.

This is to know the change in prices in the spot market.

### **Observations or Conclusions:**

- 1) Only those stocks are considered whose % change in OI is greater than 4% and whose OI is greater than 20,00,000.
- 2) If basis < 1 (or **backwardation**) and position is:
  - a) Bullish (basis increased): the stock will go sideways; if stock is following a bearish trend, it would slow down or end.
  - b) Bearish (basis decreased): the stock will go bearish (change in basis should be significant); if stock is already following a bearish trend, it would continue
- 3) If basis > 1.5 (**contango**) and position is:
  - a) Bullish (basis increased): the stock will follow the bullish trend, as the basis is already positive. Here, Basis change should be significant.  
If stock is following a bearish trend, it will end (bearish trends in contango situations are for less period).
  - b) Bearish (basis decreased): the stock will go sideways; if the stock is already following a bullish trend, it would slow down or end.
- 4) **Note: If basis > 1, dont expect bearish trend and if basis < 1, dont expect bullish trend. (market will be mostly sideways in both the cases)**
- 5) If change in basis is very high, (and OI change > 7%), then stock will follow the trend as calculated by position.
- 6) If basis change is less (depending on the underlying price), that stock would not be considered for analysis.
- 7) If basis change is low, the trend will be followed for less days (if positions don't build in that direction further).

**Managerial Implications:**

The buying and selling decisions would be taken based on this analysis.

The price at which stock would be sold or purchased would be decided.

The decision to hold the stock and to observe the positions build up in that stock would be based on the analysis done.

## Part C

### LEARNINGS

- 1) The learnings in this internship started by training. Training includes the understanding of the basics of derivatives, Futures and Options, with the help of videos. The videos were covering the following topics, which would form the basics of internship requirements:
  - a) **Basic Market Mechanism:** This involved the Basics of stock market. The point that was emphasized in this video was that “the markets discounts everything in advance”, which means that the economy, companies’ results and other such things are visible in the price movements of stocks and indices, even before the confirmation of event.
  - b) **Introduction of Derivatives market:** through this we learned the basics of futures and options contract with the help of examples of such contracts forming outside of the derivatives market.
  - c) **Understanding futures in detail:** pricing, margin requirements, MTM (mark to market) Margin, spreads and rollovers.
  - d) **Learnt the interpretation of Open Interest and position build up based on Open Interest.**
  - e) **Finally, we learned about Options basics, its pricing, Option Greeks and put-call ratio.**
- 2) After gaining the basic training through online videos, the **tasks were assigned**. The tasks were mainly based on the futures data and its analysis.
- 3) The learnings from the task assigned involved following:
  - a) **Understood the basic terminology used in Derivatives market such as Open Interest, Basis, Extrinsic Value, Intrinsic Value, Options premium, etc.**
  - b) **Learned the Analysis of historical Futures and Options Data** of Indian securities available on BSE and NSE website.
  - c) **Identifying patterns** in the futures data by comparing it with the price trends of the underlying with the help of charts, based on the collected daily data.
  - d) **Understand Data Analytics** to be applied on that data and project the future trends with the help of Analytics.



- e) Learned the Prediction of future trends to be followed by the underlying asset based on the analysis of futures data.
- f) Learned advanced excel functions such as Vlookup, Hlookup, Sumif, Nestedif, etc. used for the quantitative analysis of data.