



**Latthe Education Society's**

**Smt. Kasturbai Walchand College, Sangli.**

(Department of statistics)

**A Project Report on –**

**“Analysis of Stock prices of RELIANCE and  
TCS companies”**

Under the guidance of

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Smt. Kasturbai Walchand College, Sangli

For the academic year 2021-22.

**Smt. Kasturbai Walchand College, Sangli**



**CERTIFICATE**

This is to certify that the following students from T.Y.B.Sc. have satisfactorily carried out the project work for the subject-

**“Analysis of Stock prices of RELIANCE and TCS companies”**

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**For the academic year 2021-2022.**

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# INTRODUCTION

Stock market plays an important role in alliance with national economy and also helps in the development in the industrial sector. It helps in mobilizing the saving and ensures safety. As India is a developing economy, the study of Indian stock market and its analysis find it prominence in national development.

## **\*Investments**

An investment is an asset or item acquired with the goal of generating income or appreciation. Appreciation refers to an increase in the value of an asset over time. When an individual purchases a good as an investment, the intent is not to consume the good but rather to use it in the future to create wealth. Investments are generally bucketed into three major categories: stocks, bonds and cash equivalents.

### **The different types of investments that exist are :**

**Stocks:** A stock is an investment in a specific company. When you purchase a stock, you're buying a share a small piece of that company's earnings and assets. Companies sell shares of stock in their businesses to raise cash; investors can then buy and sell those shares among themselves.

**Bonds:** Bonds are generally considered less risky than stocks, but they also may offer lower returns. The primary risk, as with any loan, is that the issuer could default. Generally, the less risky the bond, the lower the interest rate.

**Mutual Funds:** Mutual funds allow investors to purchase a large number of investments in a single transaction. These funds pool money from many investors, then employ a professional manager to invest that money in stocks, bonds or other assets.

**Retirement Plans:** Retirement plans aren't a separate category of investment, per se, but a vehicle for making investments, including purchasing stocks, bonds and funds. The biggest advantage for retirement plans that you won't pay taxes on the money until you withdraw it in retirement.

**Commodities:** commodities are physical products any one can buy. **Etc.**

### **\*Stock Market -**

#### **Definition :**

The "stock market" is the term given to activity that takes place on stock exchanges. These are the physical locations where corporate shares trade hands. You usually refer to the stock market when you address the combined activity on many exchanges. For example, in the United States, the "stock market" is a combination of the New York Stock Exchange, the Nasdaq, the Chicago Stock Exchange and others. Some people refer to the "global markets" or the "world stock market." These refer to the overall activity on stock exchanges throughout the world.

#### **Capitalization :-**

The primary role of any stock market is to fund companies. When a corporation "goes public," it sells off part of the company to the investing public in units called "shares." When investors purchase these shares, this generates substantial capital for the company. Billions of dollars can be made nearly overnight after a public offering of stock. A company may then use this capital to create large-scale manufacturing or services. A stock sale funds everything from the shoes you wear to the telephone calls you make.

## **Reasons for Most Indians Do Not Invest In Stocks:**

### **○ Lack of Awareness:**

Many of the people are unaware towards stock investing. They do not know how much returns they can get by investing in stock market. A common villager doesn't know how to earn from stocks and doesn't understand the power of compounding.

### **○ Common Investing Myths in India:**

Since childhood, everyone hears about how his uncle/cousin/neighbor etc, who has lost his entire fortune in the stock market. Stock market investing is considered as gambling in India.

### **○ Not Willing To Take The Risk :**

The risk is always involved in stock market no matter how many studies you have done and how fundamentally strong the company is one always has to take some risks in order to get some reward.

### **○ No Security in Exchanges :**

Because of the lack of proper securities in the market, many common people tend to stay away from the market. And this is one of the key reasons why most Indians do not invest in stocks.

### **○ No Proper Courses :**

There are very few dedicated courses on the stock market. Although National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) provide few certificate courses, that's not close to fulfilling the requirements of the interested aspirants. Even many Bachelor of Commerce (B.Com), Bachelor of Business Application (BBA) or Master of Business Application (MBA), degrees don't have proper courses on investing/trading.

### ○ **Unwillingness:**

They always delay investing in the market, considering they will do so in future. This unwillingness or laziness among the people is a big reason for less participation of Indians in the stock market.

### **Sector Indicators:**

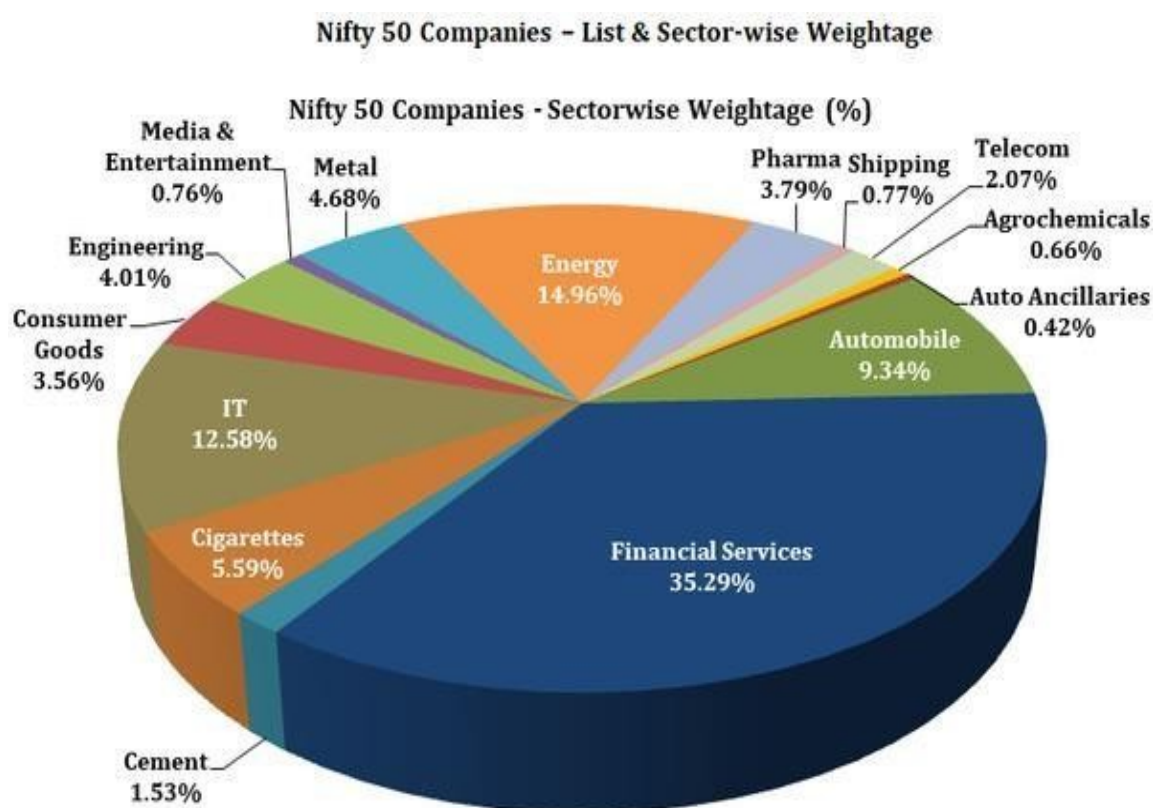
There are number of sectors or industries which are listed on NSE and BSE. In addition to this, an individual sector comprises of number of companies. There are around 73 sectors listed on NSE and BSE separately.

Some of the important sectors present on both the exchanges are as follows:-

- **Banking Sector**
- **Automobile Sector**
- **Information Technology Sector**
- **Fast Moving Consumer Goods(FMCG) Sector**
- **Media & Entertainment Sector**
- **Pharmaceuticals Sector**
- **Food Sector**
- **Public Sector Undertaking (PSU) Bank Sector**
- **Multi Nation Corporation (MNC) Sector**



In the Pie-chart shown below, there is a list and sector-wise weightage of Nifty 50 Companies. We can see that pharma sector has 3.79% weightage, Financial Services sector have highest weightage than the other sectors, that is, 35.29% and Auto Ancillaries sector have the lowest weightage than the other sectors, that is, 0.42%.



## **Basic Terminologies used in Stock market**

- 1) Stocks/Shares :** It is a security that represents the ownership of a fraction of a corporation. Units of stock are called “Shares”.
- 2) Investors :** Investor is any persons or other entity who commits capital with the expectation of receiving financial returns.
- 3) Open :** It is the price at which the financial security opens in the market when trading begins.
- 4) High :** High is the maximum value reached by the stock in period.
- 5) Low :** Low is the minimum price of stock in a period.
- 6) Close :** Close refers to the price of an individual stock when the stock exchange closed shop for the day.
- 7) Trade :** The buying and selling of financial instruments.
- 8) Sector :** A sector is an area of the economy in which businesses share the same or related product or services.
- 9) Business Day :** Monday to Friday excluding public holidays.
- 10) Equity :** Common and preferred stocks which represents shares in ownership of a company.
- 11) Volatility :** The price movements of a stock or the stock market as a whole. Highly volatile stocks are those with extreme daily up and down movements and wide intraday trading ranges.
- 12) Large cap :** When a company crosses the market capitalization of \$10 billion they comes under the category of large cap stocks.

## STUDY AREA

- **Importance of RELIANCE & TCS**

Reliance owns businesses across India engaged in energy, petrochemicals, textiles, natural resources, retail, and telecommunications. Reliance is one of the most profitable companies in India. The market capitalization value of RIL is Rs. 1,780,945 Crores with a current price of Rs. 2,716.

Tata Consultancy Services Limited (TCS) is an Indian multinational information technology (IT) service and consulting company headquartered in Mumbai, Maharashtra, India. It is a subsidiary of Tata Group and operates in 149 locations across 46 countries.

TCS is the biggest IT company in India and the second-largest Indian company by market capitalization. TCS is now placed among the most valuable IT services brands worldwide. The market capitalization value of TCS is Rs. 1,22,816 Crores with a current price of Rs. 3,409.00.

- Why **RELIANCE** and **TCS** ?

On basis of market capitalization, these two companies have been on top for last many years.

Reliance and TCS are Large cap (large caps are those companies whose market capitalization have crossed \$10 billion). Not only that, they are top 2 in group of first 100 large cap stocks.

Large caps are usually mature, well-established companies that have demonstrated their ability to be consistently successful and pay regular dividends.

Companies like Reliance and TCS basically Large cap stocks are tend to be less volatile as compared to Mid cap or Small cap stocks as a consequences of which this companies don't show much changes in prices over a short period of time basically they are much stable and less risky compared to others.

Apparently a very conservative investors always chooses large cap stocks to avoid loss .

Now it's starts making sense why we chose Reliance and TCS, we will study that when stock market were falling did large cap like TCS and Reliance were able to stand and make a less loss or not at all for investors.

➤ **Why to analyse stocks ?**

- **It enables investors to identify the intrinsic worth of security even before investing in it.**
- **It tries to find out activities of an instrument or market in future.**
- **Investors and traders arrive at equity buying and selling decisions.**

**Helps investors and traders to gain edge in market to make informed decision.**

## **Aim and objectives**

We aim in carrying out a study on analysis of Indian Stock market based on the data of share prices of 2 of the top companies in India by market captilization. Some of the objectives are as below-

- 1. To check the effect of pandemic situations on share prices of RELIANCE and TCS.**
- 2. To forecast monthly prices of shares of both companies. Also to check trend of prices of both companies**

## Method of data collection

The pertained data of share prices at daily time step were collected from the secondary source viz. Yahoo finance website (<https://www.finance.yahoo.com>). The daily share prices were taken between January 2019 to January 2022. For the study we have taken 2 companies which are Reliance and TCS.

## STATISTICAL TOOLS USED FOR ANALYSIS

### ❖ Paired t-test

The paired t-test compares the means of two measurements taken from the same individual, object or related units. These paired measurements can represent things like:

A measurement taken from two different times (e.g.: pre-test and post-test with an intervention administered between the two points). A measurement taken under two different conditions (e.g.: completing a test under a control condition and an experimental condition) etc.

The purpose of the test is to determine whether there is statistical evidence that mean difference between paired observations is significantly different from zero.

#### **Assumptions :**

1. Dependent variable must be continuous.
2. The dependent variable should be approximately normally distributed.
3. The dependent variable should not contain any outlier.

#### **The hypothesis are:**

Null hypothesis :

$$H_0: \mu_d = 0$$

Alternative hypothesis :

$$H_1: \mu_d \neq 0$$



**The test statistic is:**

$$t = \frac{\bar{d} - \mu_d}{s_d / \sqrt{n}}$$

Where  $\bar{d}$  is the mean difference. The standard error of  $\bar{d}$  is  $\frac{s_d}{\sqrt{n}}$  where  $s_d$  is the standard deviation of the differences.

Under the null hypothesis, this statistic follows a t-distribution with  $n - 1$  degrees of freedom with  $\alpha$  level of significance.

## ❖ Time series

### i) Exponential Smoothing :-

Exponential smoothing is a time series forecasting method for univariate data. Exponential smoothing forecasting methods are similar in that a prediction is a weighted sum of past observations, but the model explicitly uses an exponentially decreasing weight for past observations.

This smoothing scheme begins by setting  $S_2$  to  $y_1$ , where  $S_i$  stands for smoothed observation or EWMA, and  $y$  stands for the original observation. The subscripts refer to the time periods,  $1, 2, \dots, n$ . For the third period,  $S_3 = \alpha y_2 + (1 - \alpha)S_2$ ; and so on. There is no  $S_1$ ; the smoothed series starts with the smoothed version of the second observation.

For any time period  $t$ , the smoothed value  $S_t$  is found by computing

$$S_t = \alpha y_t + (1 - \alpha)S_{t-1} \quad 0 < \alpha \leq 1.$$

This is the basic equation of exponential smoothing and the constant or parameter  $\alpha$  is called the smoothing constant.

## **ii) Time series (trendline) :-**

Trend is general tendency of data to increase or decrease over a period of time. This change is either upward or downward. Mathematically, the trend will be linear or non-linear. We measure trend because it gives knowledge of past behavior of observations. We can decide whether to buy stock or not by using trendline of particular company values.



## Paired t-test

### TCS

#### ❖ t-Test: Paired Two Sample for Means of open prices

The hypothesis are

**H<sub>0</sub>** : There is no significant difference between means of open prices from before pandemic and during pandemic.

**H<sub>1</sub>** : There is significant difference between means of open prices from before pandemic and during pandemic.

TEST STATISTIC:

$$t = \frac{\bar{d} - \mu_d}{s_d / \sqrt{n}}$$
$$t \sim t_{n-1} \text{ d.f.}$$

Therefore we reject H<sub>0</sub> at 5% level of significance , if  $|t| > t_{n-1} \text{ d.f.}$

| t-Test: Paired Two Sample for Means |                       |                       |
|-------------------------------------|-----------------------|-----------------------|
|                                     | Open(before pandemic) | Open(during pandemic) |
| Mean                                | 1491.828461           | 2709.819444           |
| Variance                            | 109318.7817           | 405327.9426           |
| Observations                        | 36                    | 36                    |
| t Stat                              | 0.938108842           |                       |
| P(T<=t) one-tail                    | 0                     |                       |
| t Critical one-tail                 | 35                    |                       |
| P(T<=t) two-tail                    | -21.1222712           |                       |
| t Critical two-tail                 | 8.36632E-22           |                       |

**Conclusions: Here  $|t| = 0.938108842 > t_{(n-1)\text{d.f.}} = 8.36632\text{E-}22$**

Therefore we do reject the null hypothesis , and conclude that there is significant difference between mean of open prices from before Covid-19 and during Covid-19. So we can see the effect of pandemic on open prices.

❖ **t-Test: Paired Two Sample for Means of close prices**

**The hypothesis are**

**H<sub>0</sub>** : There is no significant difference between means of close prices from before pandemic and during pandemic.

**H<sub>1</sub>** : There is significant difference between means of close prices from before pandemic and during pandemic.

**TEST STATISTIC:**

$$t = \frac{\bar{d} - \mu_d}{s_d / \sqrt{n}}$$

$$t \sim t_{(n-1)d.f.}$$

Therefore we reject H<sub>0</sub> at 5% level of significance , if  $|t| > t_{n-1 \text{ d.f.}}$

| <b>t-Test: Paired Two Sample for Means</b> |                               |                               |
|--|-------------------------------|-------------------------------|
|  | <b>Close(before pandemic)</b> | <b>Close(during pandemic)</b> |
| <b>Mean</b>                                | <b>1427.140286</b>            | <b>2585.102773</b>            |
| <b>Variance</b>                            | <b>99474.77504</b>            | <b>365879.7725</b>            |
| <b>Observations</b>                        | <b>36</b>                     | <b>36</b>                     |
| <b>t Stat</b>                              | <b>0.932607553</b>            |                               |
| <b>P(T&lt;=t) one-tail</b>                 | <b>0</b>                      |                               |
| <b>t Critical one-tail</b>                 | <b>35</b>                     |                               |
| <b>P(T&lt;=t) two-tail</b>                 | <b>-20.99469533</b>           |                               |
| <b>t Critical two-tail</b>                 | <b>1.01875E-21</b>            |                               |

**Conclusions:**

**Here  $|t| = 0.932607553 > t_{(n-1)d.f.} = 1.01875E-21$**

Therefore we do reject the null hypothesis. There is significant difference between means of close prices from before pandemic and during pandemic. So we can see the effect of pandemic on close prices.

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### ❖ t-Test: Paired Two Sample for Means of High prices

**The hypothesis are**

**H<sub>0</sub>** : There is no significant difference between means of high prices from before pandemic and during pandemic.

**H<sub>1</sub>** : There is significant difference between means of high prices from before pandemic and during pandemic.

**TEST STATISTIC:**

$$t = \frac{\bar{d} - \mu_d}{s_d / \sqrt{n}}$$
$$t \sim t_{(n-1)d.f.}$$

Therefore we reject H<sub>0</sub> at 5% level of significance , if  $|t| > t_{n-1 \text{ d.f.}}$

| t-Test: Paired Two Sample for Means |                       |                       |
|-------------------------------------|-----------------------|-----------------------|
|                                     | High(before pandemic) | High(during pandemic) |
| Mean                                | 1491.828461           | 2709.819444           |
| Variance                            | 109318.7817           | 405327.9426           |
| Observations                        | 36                    | 36                    |
| t Stat                              | 0.938108842           |                       |
| P(T<=t) one-tail                    | 0                     |                       |
| t Critical one-tail                 | 35                    |                       |
| P(T<=t) two-tail                    | -21.1222712           |                       |
| t Critical two-tail                 | 8.36632E-22           |                       |

### Conclusions:

**Here  $|t| = 0.938108842 > t_{(n-1)d.f.} 8.36632E-22$**

Therefore we do reject the null hypothesis. There is significant difference between means of high prices from before pandemic and during pandemic. So we can see the effect of pandemic on high prices

### ❖ t-Test: Paired Two Sample for Means of Low prices

The hypothesis are

**H<sub>0</sub>** : There is no significant difference between means of low prices from before pandemic and during pandemic.

**H<sub>1</sub>** : There is significant difference between means of low prices from before pandemic and during pandemic.

**TEST STATISTIC:**

$$t = \frac{\bar{d} - \mu_d}{s_d / \sqrt{n}}$$

$$t \sim t_{(n-1)d.f.}$$

Therefore we reject H<sub>0</sub> at 5% level of significance , if  $|t| > t_{n-1 \text{ d.f.}}$

| t-Test: Paired Two Sample for Means |                      |                      |
|-------------------------------------|----------------------|----------------------|
|                                     | Low(before pandemic) | Low(during pandemic) |
| Mean                                | 1336.15764           | 2427.159726          |
| Variance                            | 83210.77104          | 354874.1121          |
| Observations                        | 36                   | 36                   |
| t Stat                              | 0.913417645          |                      |
| P(T<=t) one-tail                    | 0                    |                      |
| t Critical one-tail                 | 35                   |                      |
| P(T<=t) two-tail                    | -18.57747636         |                      |
| t Critical two-tail                 | 5.22507E-20          |                      |

### Conclusions:

Here  $|t| = 0.913417645 > t_{(n-1)d.f.} = 5.22507E-20$

Therefore we do reject the null hypothesis. There is significant difference between means of low prices from before pandemic and during pandemic. So we can see the effect of pandemic on low prices.

## RELIANCE



**t-Test: Paired Two Sample for Means of open prices.**

**The hypothesis are**

**H<sub>0</sub>** : There is no significant difference between means of open prices from before pandemic and during pandemic.

**H<sub>1</sub>** : There is significant difference between means of open prices from before pandemic and during pandemic.

**TEST STATISTIC:**

$$t = \frac{\bar{d} - \mu_d}{s_d / \sqrt{n}}$$

$$t \sim t_{(n-1)d.f.}$$

Therefore we reject H<sub>0</sub> at 5% level of significance , if  $|t| > t_{n-1 \text{ d.f.}}$

| t-Test: Paired Two Sample for Means |                       |                       |
|-------------------------------------|-----------------------|-----------------------|
|                                     | Open(before pandemic) | Open(during pandemic) |
| Mean                                | 750.8019012           | 1722.689524           |
| Variance                            | 60424.32221           | 192539.7516           |
| Observations                        | 36                    | 36                    |
| t Stat                              | 0.897863282           |                       |
| P(T<=t) one-tail                    | 0                     |                       |
| t Critical one-tail                 | 35                    |                       |
| P(T<=t) two-tail                    | -23.95154053          |                       |
| t Critical two-tail                 | 1.35628E-23           |                       |

**Conclusions:**

**Here  $|t| = 0.897863282 > t_{(n-1)d.f.} 1.35628E-23$**

Therefore we do reject the null hypothesis. There is significant difference between means of open prices from before pandemic and during pandemic. So we can see the effect of pandemic on open prices.

---

❖ **t-Test: Paired Two Sample for Means of close prices.**

**The hypothesis are**

**H<sub>0</sub>** : There is no significant difference between means of close prices from before pandemic and during pandemic.

**H<sub>1</sub>** : There is significant difference between means of close prices from before pandemic and during pandemic.

**TEST STATISTIC:**

$$t = \frac{\bar{d} - \mu_d}{s_d / \sqrt{n}}$$

$$t \sim t_{(n-1)d.f.}$$

Therefore we reject H<sub>0</sub> at 5% level of significance , if  $|t| > t_{n-1 \text{ d.f.}}$

| <b>t-Test: Paired Two Sample for Means</b> |                               |                               |
|--|-------------------------------|-------------------------------|
|  | <b>Close(before pandemic)</b> | <b>Close(during pandemic)</b> |
| <b>Mean</b>                                | <b>766.1267811</b>            | <b>1750.897475</b>            |
| <b>Variance</b>                            | <b>61545.46735</b>            | <b>192608.1341</b>            |
| <b>Observations</b>                        | <b>36</b>                     | <b>36</b>                     |
| <b>t Stat</b>                              | <b>0.903279938</b>            |                               |
| <b>P(T&lt;=t) one-tail</b>                 | <b>0</b>                      |                               |
| <b>t Critical one-tail</b>                 | <b>35</b>                     |                               |
| <b>P(T&lt;=t) two-tail</b>                 | <b>-24.64899616</b>           |                               |
| <b>t Critical two-tail</b>                 | <b>5.24578E-24</b>            |                               |

**Conclusions:**

**Here  $|t| = 0.903279938 > t_{(n-1)d.f.} = 5.24578E-24$**

Therefore we do reject the null hypothesis. There is significant difference between mean of close prices from before pandemic and during pandemic. So we can see the effect of pandemic on close prices.



❖ **t-Test: Paired Two Sample for Means of High prices.**

**The hypothesis are**

**H<sub>0</sub>** : There is no significant difference between means of high prices from before pandemic and during pandemic.

**H<sub>1</sub>** : There is significant difference between means of high prices from before pandemic and during pandemic.

**TEST STATISTIC:**

$$t = \frac{\bar{d} - \mu_d}{s_d / \sqrt{n}}$$
$$t \sim t_{(n-1)d.f.}$$

Therefore we reject H<sub>0</sub> at 5% level of significance , if  $|t| > t_{n-1 \text{ d.f.}}$

|                     | High(before pandemic) | High(during pandemic) |
|---------------------|-----------------------|-----------------------|
| Mean                | 802.0714722           | 1862.874502           |
| Variance            | 69194.70349           | 211225.3878           |
| Observations        | 36                    | 36                    |
| t Stat              | 0.921966248           |                       |
| P(T<=t) one-tail    | 0                     |                       |
| t Critical one-tail | 35                    |                       |
| P(T<=t) two-tail    | -26.54375345          |                       |
| t Critical two-tail | 4.46442E-25           |                       |

**Conclusions:**

**Here  $|t| = 0.921966248 > t_{(n-1)d.f.} = 4.46442E-25$**

Therefore we do reject the null hypothesis. There is significant difference between mean of high prices from before pandemic and during pandemic. So we can see the effect of pandemic on high prices.

❖ **t-Test: Paired Two Sample for Means of Low prices.**

**The hypothesis are**

**H<sub>0</sub>** : There is no significant difference between means of low prices from before pandemic and during pandemic.

**H<sub>1</sub>** : There is significant difference between means of low prices from before pandemic and during pandemic.

**TEST STATISTIC:**

$$t = \frac{\bar{d} - \mu_d}{s_d / \sqrt{n}}$$

$$t \sim t_{(n-1)d.f.}$$

Therefore we reject H<sub>0</sub> at 5% level of significance , if | t | > t<sub>n-1 d.f.</sub>

| <b>t-Test: Paired Two Sample for Means</b> |                             |                             |
|--|-----------------------------|-----------------------------|
|  | <b>Low(before pandemic)</b> | <b>Low(during pandemic)</b> |
| <b>Mean</b>                                | <b>713.6430155</b>          | <b>1627.663152</b>          |
| <b>Variance</b>                            | <b>50783.41853</b>          | <b>188771.8801</b>          |
| <b>Observations</b>                        | <b>36</b>                   | <b>36</b>                   |
| <b>t Stat</b>                              | <b>0.886548533</b>          |                             |
| <b>P(T&lt;=t) one-tail</b>                 | <b>0</b>                    |                             |
| <b>t Critical one-tail</b>                 | <b>35</b>                   |                             |
| <b>P(T&lt;=t) two-tail</b>                 | <b>-21.35494701</b>         |                             |
| <b>t Critical two-tail</b>                 | <b>5.85703E-22</b>          |                             |

**Conclusions:**

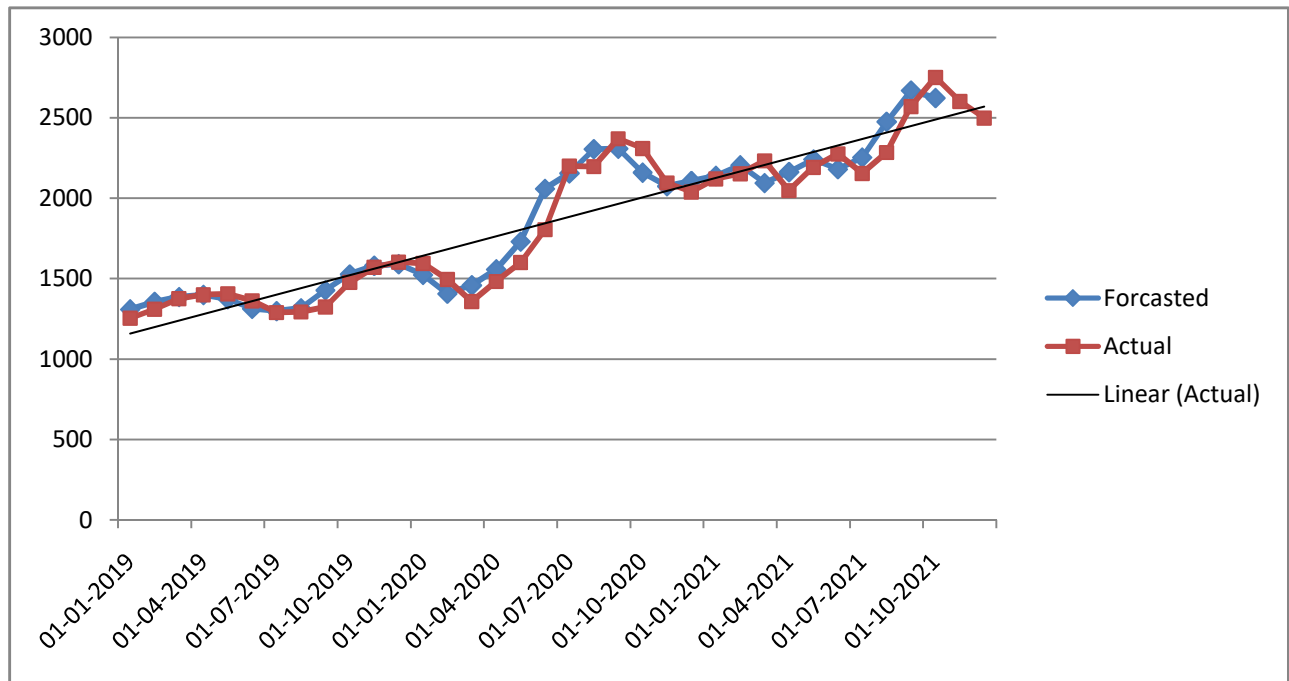
**Here | t | = 0.886548533 > t<sub>(n-1)d.f.</sub> = -21.35494701**

Therefore we do reject the null hypothesis. There is significant difference between mean of low prices from before pandemic and during pandemic. So we can see the effect of pandemic on low prices.

- **TIME SERIES**

**EXPONENTIAL SMOOTHING :- FOR RELIANCE**

- Below is the graph of exponential smoothing for high prices : -



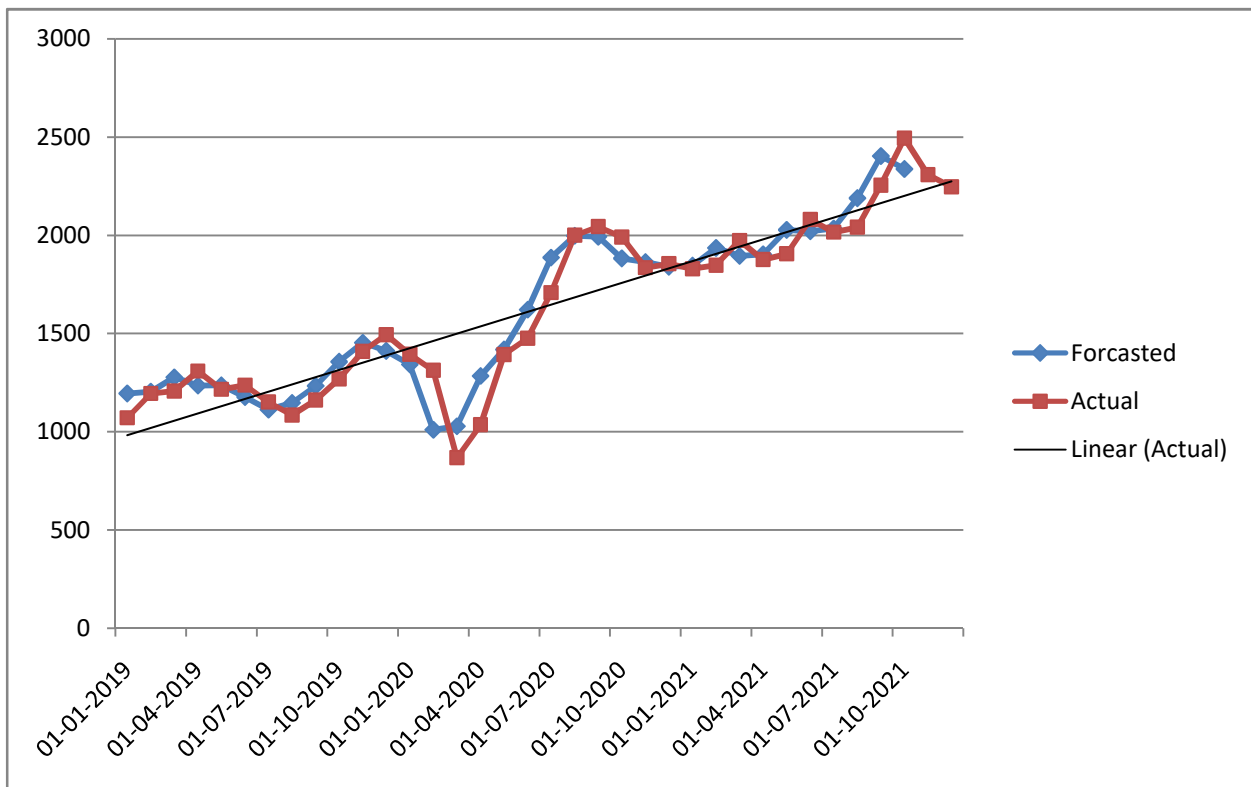
**Interpretation:**

On this smoothing plot, the fits closely follow the data, especially at the end of the series. We can expect high price to be around 1827 for the next month with a range of approximately 1675 to 1980.

We can see trend of values from above chart using trendline which is increasing.

So, future values are expected to rise for this company.

- Below is the graph for exponential smoothing of low prices :-



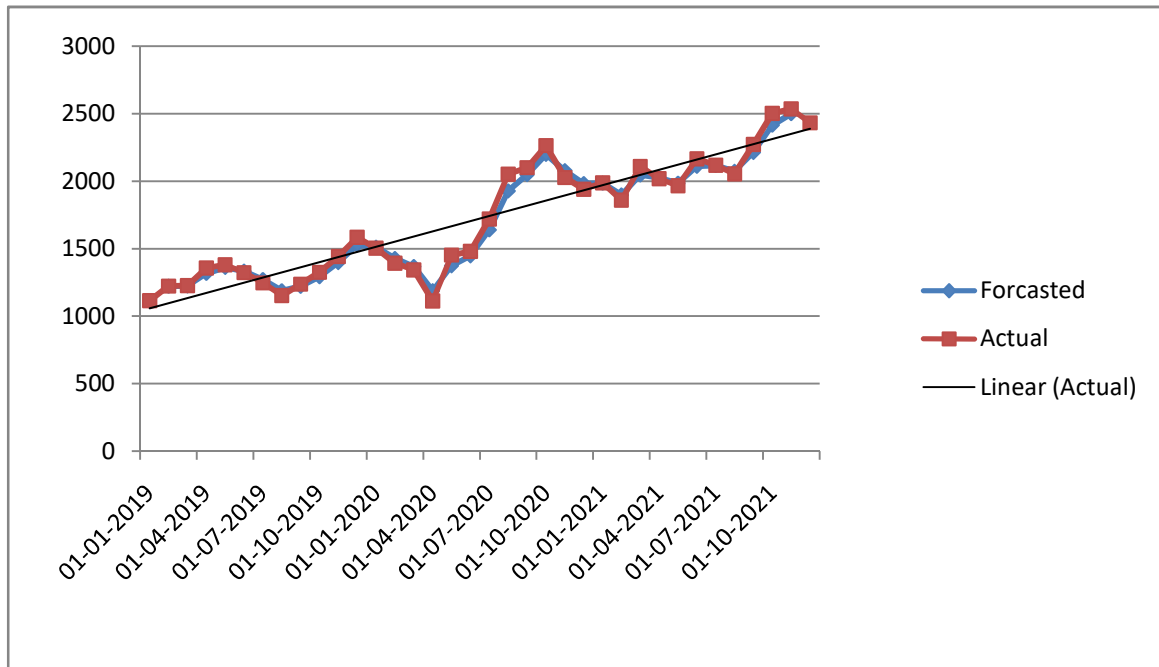
## Interpretation:

On this smoothing plot, the fits closely follow the data, especially at the end of the series. We can expect low price to be around 1611 for the next month with a range of approximately 1469 to 1753

We can see trend of values from above chart using trendline which is increasing.

So, future values are expected to rise for this company.

- Below is the graph for exponential smoothing of open prices :-



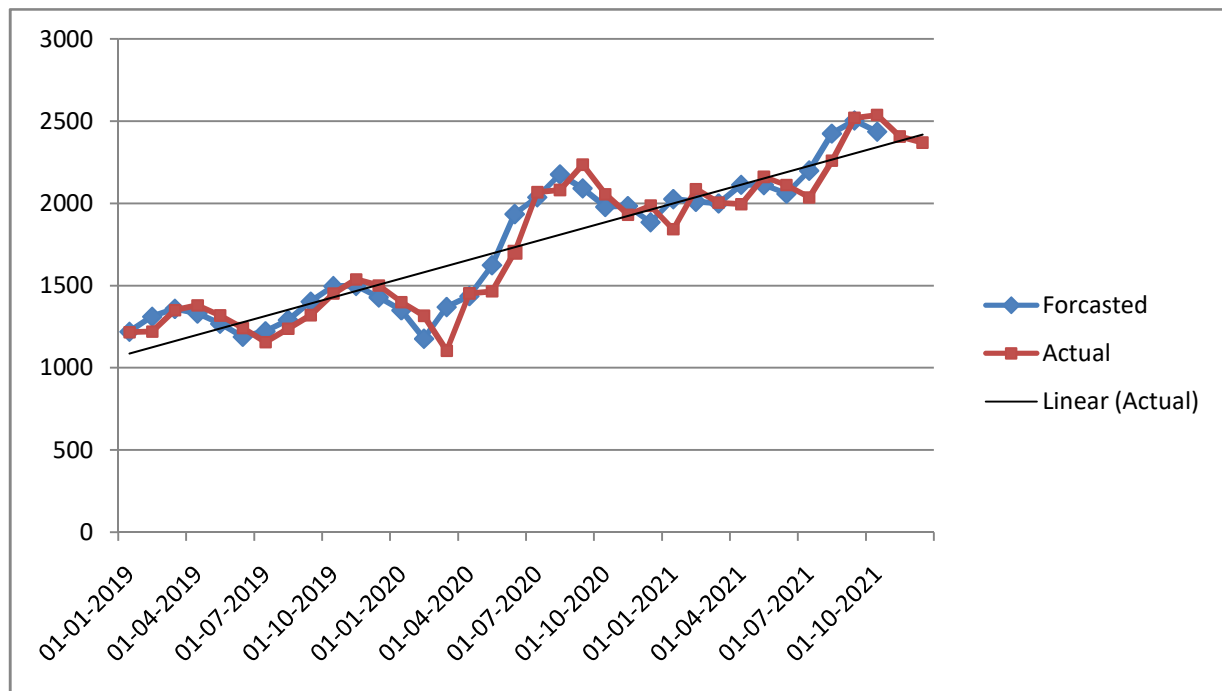
## Interpretation:

On this smoothing plot, the fits closely follow the data, especially at the end of the series. We can expect open price to be around 1685 for the next month with a range of approximately 1543 to 1827.

We can see trend of values from above chart using trendline which is increasing.

So, future values are expected to rise for this company.

- Below is the graph for exponential smoothing of close prices :-



## Interpretation:

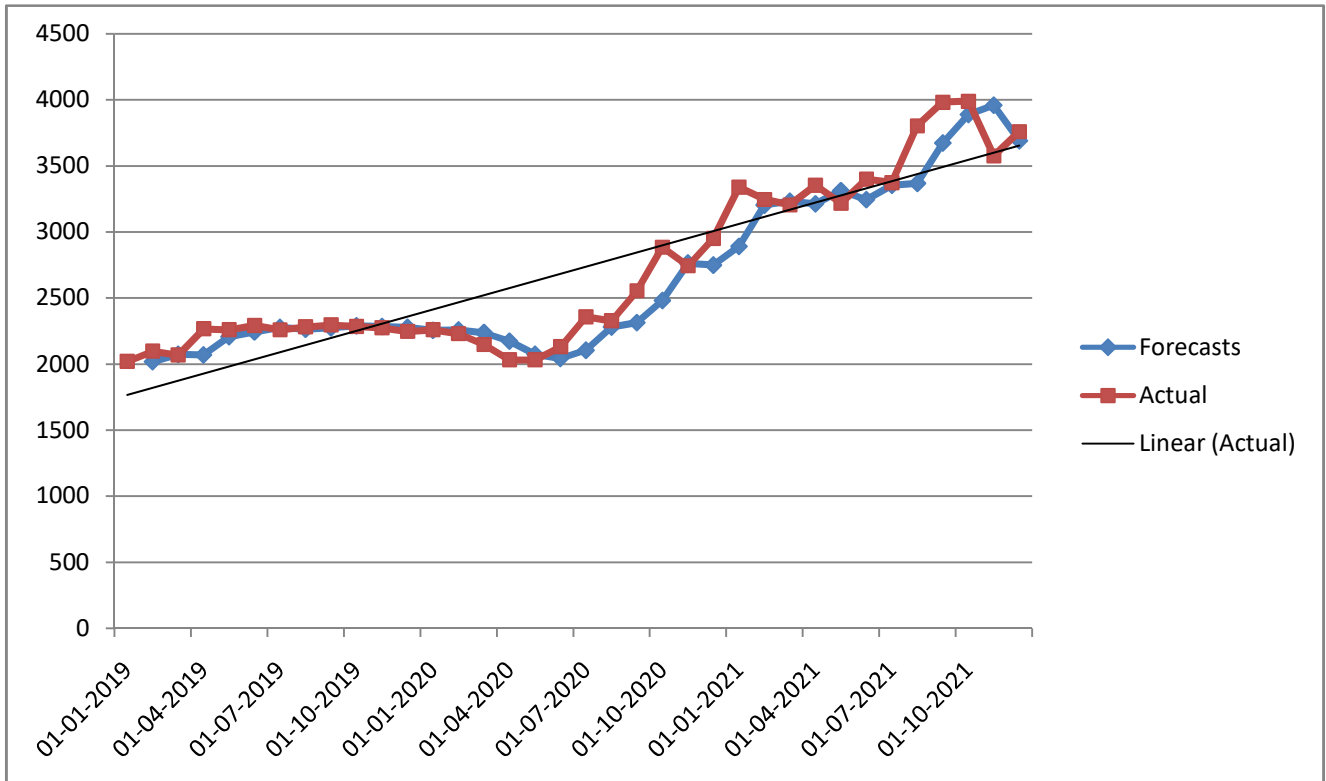
On this smoothing plot, the fits closely follow the data, especially at the end of the series. We can expect close price to be around 1733 for the next month with a range of approximately 1587 to 1878

We can see trend of values from above chart using trendline which is increasing.

So, future values are expected to rise for this company.

## EXPONENTIAL SMOOTHING :- FOR TCS

- Below is the graph for exponential smoothing of high prices-



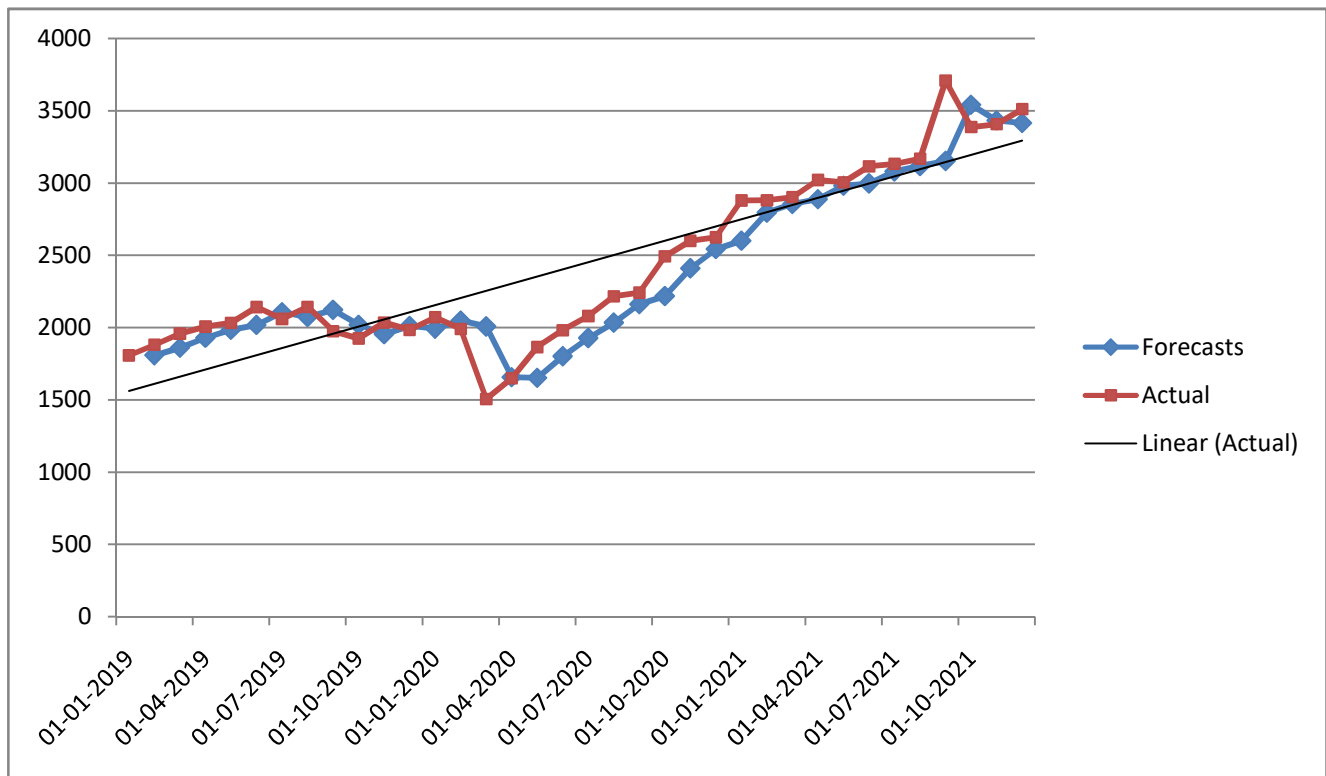
### Interpretation:

On this smoothing plot, the fits closely follow the data, especially at the end of the series. We can expect high price to be around 2659 for the next 6 month with a range of approximately 2451 to 2867

We can see trend of values from above chart using trendline which is increasing.

So, future values are expected to rise for this company.

- Below is the graph for exponential smoothing of low prices-



## Interpretation:

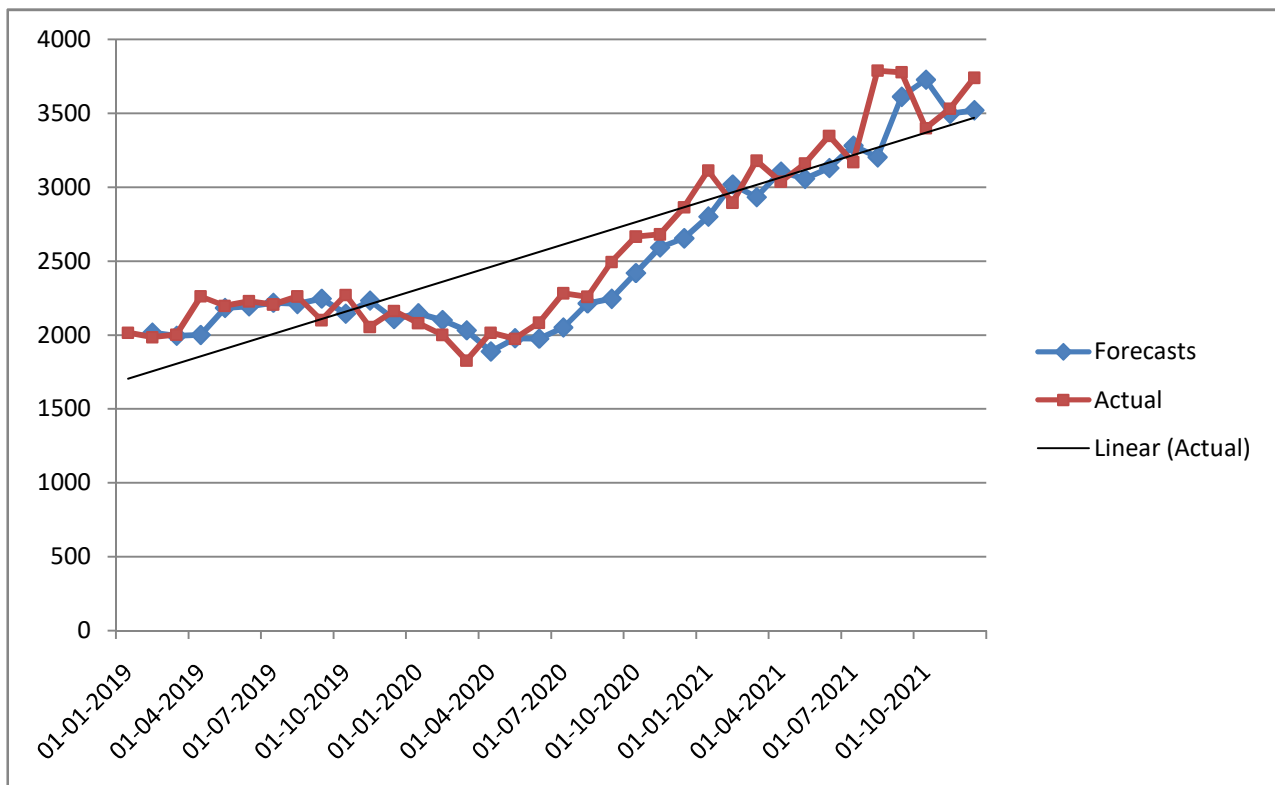
On this smoothing plot, the fits closely follow the data, especially at the end of the series. We can expect low price to be around 2376 for the next 6 month with a range of approximately 2184 to 2568

We can see trend of values from above chart using trendline which is increasing.

So, future values are expected to rise for this company.



- Below is the graph for exponential smoothing of close prices-



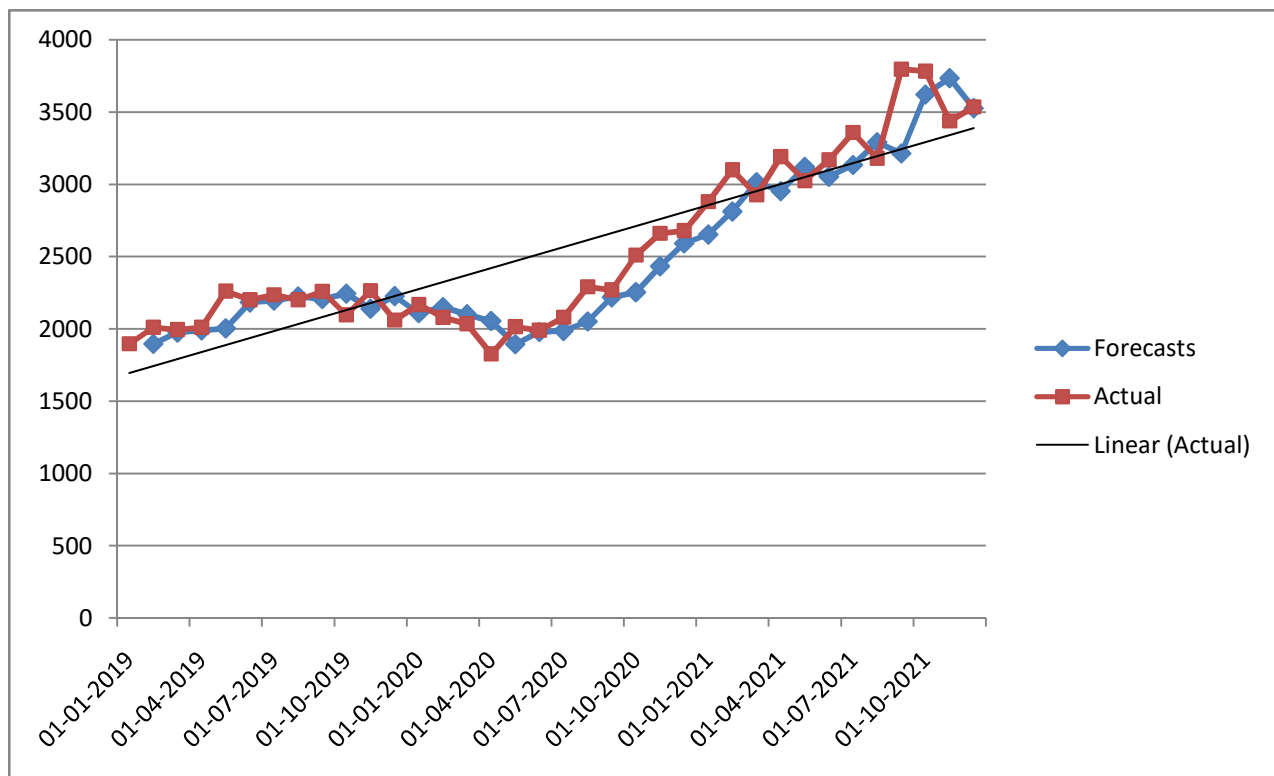
## Interpretation:

On this smoothing plot, the fits closely follow the data, especially at the end of the series. We can expect close price to be around 2533 for the next month with a range of approximately 2340 to 2727

We can see trend of values from above chart using trendline which is increasing.

So, future values are expected to rise for this company.

- Below is the graph for exponential smoothing of open prices-



## Interpretation:

On this smoothing plot, the fits closely follow the data, especially at the end of the series. We can expect open price to be around 2492 for the next month with a range of approximately 2303 to 2681

We can see trend of values from above chart using trendline which is increasing.

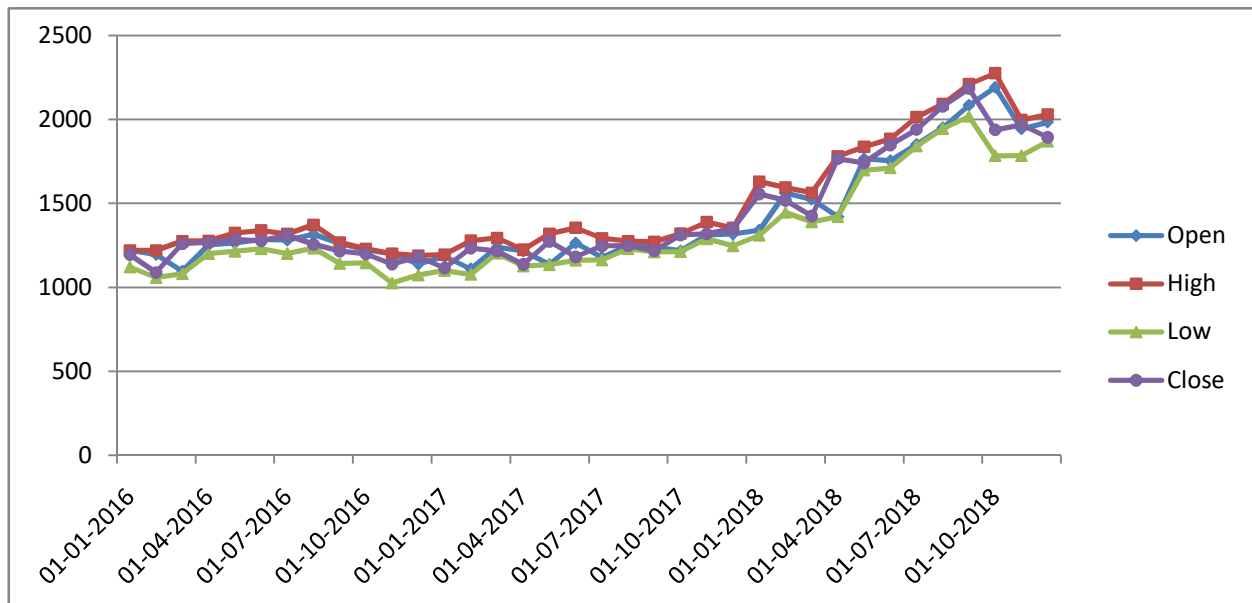
So, future values are expected to rise for this company.



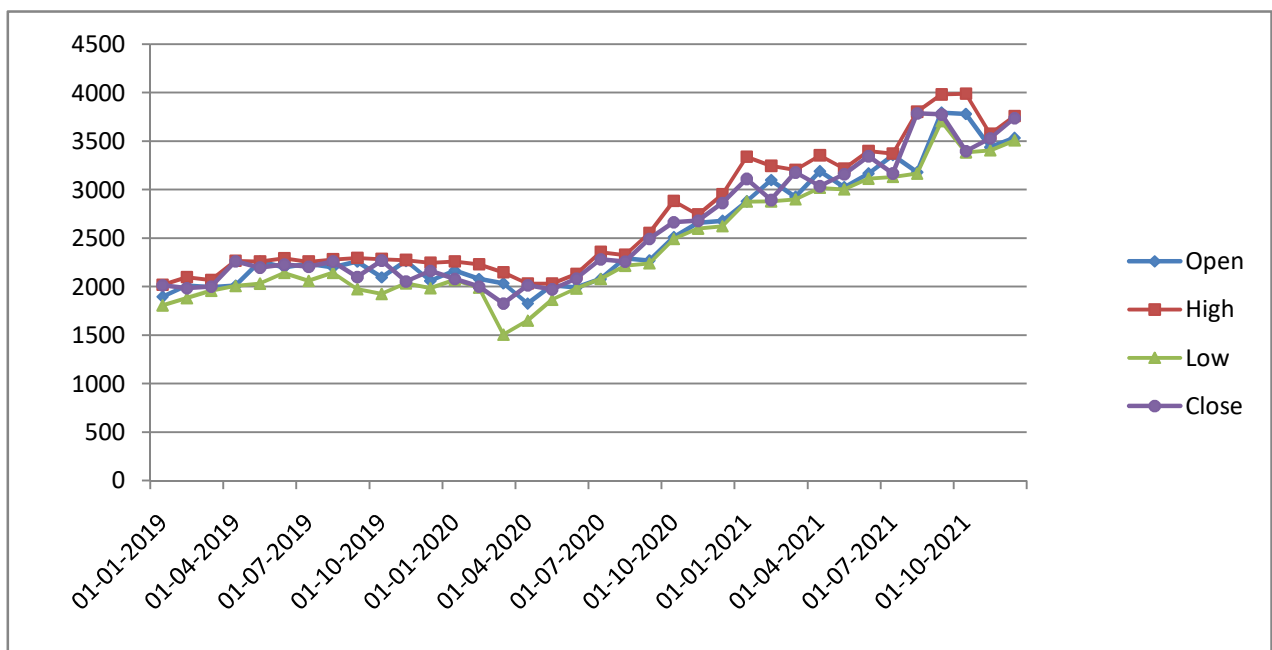
## GRAPHICAL REPRESENTATION

We use line-chart to present data.

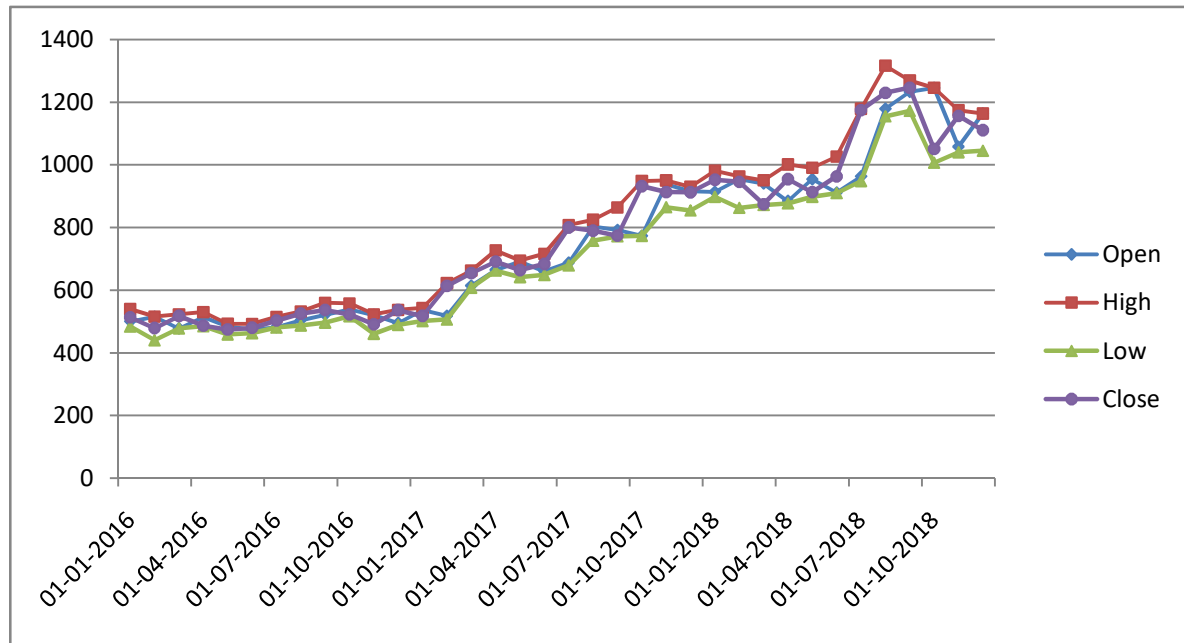
- **Following chart represents stock prices of TCS company for January 2016 to December 2018.**



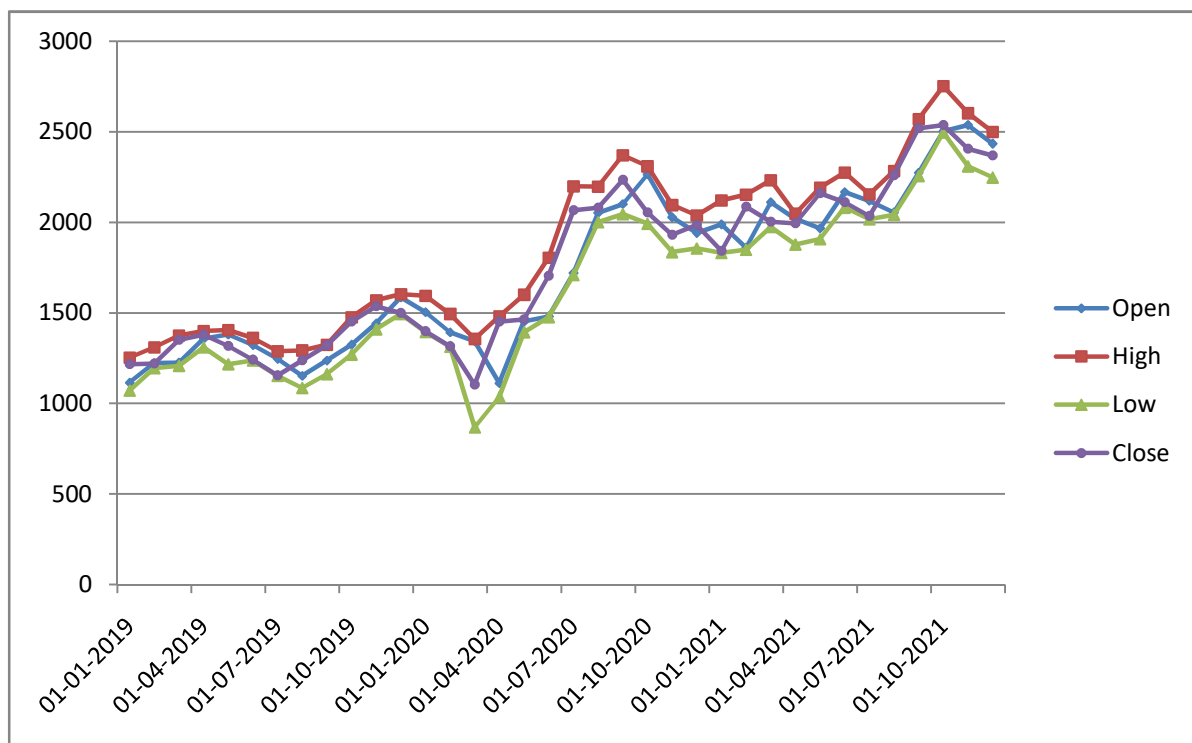
- **Following chart represents stock prices of TCS company for January 2019-December-2021**



- Following chart represents stock prices of reliance company for January 2016 to December 2018.



- Following chart represents stock prices of reliance company for January 2019 to December 2021.



## **Over all Conclusions**

- We have seen that, for the 2 companies considered RELIANCE and TCS, COVID-19 has significantly affected the stock prices but still it manages not to fall as much as mid cap and small cap.
- It is observed that, the forecasted values lie near to the actual values. Hence exponential smoothing is a good method for short time forecasting and we can predict future values using this method.
- From trendline we can see that the price values are expected to rise in future for both RELIANCE and TCS company.
- In graphical representation we saw that, share price of TCS in 01-04-2020 shows a sudden dip which happened because of the fear of covid-19 also the share price of Reliance went down in same month i.e April 2020.

## References

- <https://tradebrains.in/top-10-companies-in-india-by-market-capitalization/>
- <https://finance.yahoo.com/quote/RELIANCE.NS/history?period1=1451606400&period2=1546214400&interval=1mo&filter=history&frequency=1mo&includeAdjustedClose=true>
- <https://finance.yahoo.com/quote/TCS.NS/history?period1=1623683047&period2=1655219047&interval=1mo&filter=history&frequency=1mo&includeAdjustedClose=true>

Thank you !