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CORRELATION BETWEEN STEEL PRICES AND TATA STEEL STOCK PRICES AND CORRELATION BETWEEN STEEL PRICES AND JINDAL STEEL AND POWER STOCK PRICES

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ABSTRACT

The research paper is about finding the correlation between Steel prices and Tata Steel share prices and the correlation between Steel prices and Jindal Steel share prices. For this, we have used the Karl Pearson Coefficient of correlation method.

KEYWORDS - Steel prices, Tata Steel, Jindal Steel, Correlation

INTRODUCTION

Steel is the Earth's chief engineering and construction material. Steel is not exactly a pure element but an alloy made up of iron and some percentage of carbon and many different elements may be added to make steel. Steel plays an important role in the fields of infrastructure and economic development as a whole. China is the leading producer of steel in the world. It produces around 60% of the world's total steel production. Countries like Japan, India, and the USA are next in line.

TATA STEEL

Tata steel is an Indian-originated multinational company making steel. It was previously known as Tata Iron and Steel Company Limited (TISCO). It is one of the ventures of the Tata group. It is one of the top steel-producing companies in the world. It is the second-largest company of steel in India. It has its headquarters in Mumbai, Maharashtra. It is operational in 26 countries. It employs around 80,500 employees. It was founded on 26th August 1907 by Mr Jamsetji Nusserwanji Tata and Mr Dorabji Tata. The current CEO of Tata Steel is T.V. Narendran. In 2021 November it was the company with the maximum profits in the Tata Group.

JINDAL STEEL AND POWER

Jindal Steel and Power is an Indian steel company which is based in New Delhi. It is the supreme player in the steel market of India. Om Prakash Jindal is the originator of Jindal Steel. It was started in November in the year 2004. It is the only private company in the country of India to produce rails. The share of the company is listed on the Bombay Stock Exchange and also on the national stock exchange of India. Naveen Jindal proud son of Om Prakash Jindal is the current chairman of Jindal Steel. Mr Bimlendra Jha is the managing director, Mr D.K. Saraogi is the wholesome director, Mr Ramkumar Ramaswamy is the chief finance officer and many others include the top management at Jindal Steel and Power.

USES OF STEEL

The steel industry in the country of India is one of the most important industries within the country of India. Steel is used for many purposes like making roads, railways, bridges, buildings, etc. It is also used in the making of cars, trucks, trains, buses, and bikes. Steel is also used to make nails, bolts, screws, etc. Industries like defense, transportation, energy, aeronautics, construction, etc have a huge demand and requirement for steel.

The method used to calculate the correlation is the Karl Pearson Coefficient of Correlation

CORRELATION

We are now interested in measures of linear relationships between two variables. Such a technique is known as bivariate analysis. It involves the analysis of two quantitative variables to determine the relationship between them. For instance, if

we consider the heights and weights of a group of people, the increase in one variable (say, height) will most likely increase the other variable. On the other hand, if we consider the price and demand of a commodity, the increase in one variable (say, price) will most likely result in a decrease in the other variable. It does not mean that any two variables will always have such a relationship between them.

Considering the weights and income of a group of people, then we do not expect that the increase in one variable (say, weight) will result in either increase or a decrease in the other variable. The bivariate analysis includes various statistical tools such as covariance, correlation, and regression.

Correlation: It is & a statistical tool that is used to measure the quantitative relationship between two variables.

1)Positive Correlation: It is a relationship between two variables where if one variable increases (Or decreases), the other one also increases (or decreases). If two variables have a positive correlation. then we say that they are positively correlated

2)Negative Correlation: It is a relationship between two variables where if one variable increases (or decreases), the other one decreases (or increases). If two variables have a negative correlation. then we say that they are negatively correlated.

3)No Correlation: It is a situation in which the two variables do not show any kind of relationship. If two variables do not correlate, then we say that they are uncorrelated.

KARL PEARSON'S COEFFICIENT

Karl Pearson's Coefficient of Correlation is a number that summarises in one value, the type and degree of correlation between two variables. It has been named after English mathematician, Karl Pearson who developed this coefficient from a related idea introduced by some other mathematician. This coefficient is sometimes called Pearson product-moment correlation coefficient.

SCATTER DIAGRAM

The scatter diagram is one of the simplest methods for understanding the relationship between two variables. In this method, the values x_1,x_2, ..., x_n and y_1, y_2, . .., y_n of the variables x and y, respectively, are taken as ordered pairs (x_i;y_i). i = 1,2.... n and are plotted on a graph paper in the form of dots. This representation of given data includes dots scattered on a paper, so the diagram is called a scatter diagram.

CORRELATION BETWEEN STEEL PRICES AND JINDAL STEEL AND POWER SHARE PRICES

$$r = \frac{n\sum xy - \sum x \sum y}{\sqrt{n\sum x^2 - (\sum x)^2}\sqrt{n\sum y^2 - (\sum y^2)}}$$

$x = steel\ prices, \quad y = Jindal\ Steels\ and\ Power\ (Stock)\ price$

$\sum x = 1.75 \times 10^6 \quad \sum x^2 = 2.29 \times 10^{11} \quad \sum y = 10436. \quad \sum y^2 = 3.80 \times 10^6$

$\sum xy = 5.64 \times 10^8 \quad n = 33$

$$r = \frac{(33 \times 5.64 \times 10^8 - 1.75 \times 10^6 \times 10436)}{\sqrt{33 \times 2.29 \times 10^{11} - (1.75 \times 10^6)^2}\sqrt{33 \times 3.80 \times 10^6 - (10436)^2}}$$

$$r = \frac{1.86 \times 10^{10} - 1.,83 \times 10^{10}}{\sqrt{7.56 \times 10^{12} - 3.06 \times 10^{12}}\sqrt{1.25 \times 10^8 - 1.08 \times 10^8}}$$

$$r = \frac{10^{10} \times (1.86 - 1.83)}{10^6\sqrt{7.56 - 3.06} \times 10^4\sqrt{1.25 - 1.08}}$$

$$r = \frac{10^{10-6-4}(0.03)}{\sqrt{4.5}\sqrt{0.17}}$$

$$r = \frac{0.03}{0.8746}$$

$$r = 0.0343$$

No correlation between steel prices and Jindal steel share price

CORRELATION BETWEEN STEEL PRICES AND TATA STEEL SHARE PRICES

Now,

$x = steel\ prices, \quad y = price\ of\ TATA\ Steel\ Shares$

$$\sum x = 1.75 \times 10^6$$

$$\sum x^2 = 2.29 \times 10^{11}$$

$$\sum y = 2730.62$$

$$\sum y^2 = 279767.035$$

$$\sum xy = 1.46 \times 10^8$$

$$n = 33$$

Applying the same method of r, we get:

$$r = \frac{33 \times 1.46 \times 10^8 - 1.75 \times 10^6 \times 2730.62}{\sqrt{33 \times 2.29 \times 10^{11} - (1.75 \times 10^6)^2}\sqrt{279767.035 - (2730.62)^2}}$$

$$r = 0.0125$$

Again, no correlation between steel prices and TATA steel share price

CORRELATION BETWEEN TATA STEEL SHARE PRICE AND JINDAL STEEL AND POWER SHARE PRICE

$x = Share\ price\ of\ TATA\ steel, \quad y = Share\ price\ of\ Jindal\ Steel\ and\ Power$

$$\sum x = 2730.62$$

$$\sum x^2 = 279767.035$$

$$\sum y = 10436$$

$$\sum y^2 = 3.80 \times 10^6$$

$$\sum xy = 1.012 \times 10^6$$

$$n = 33$$

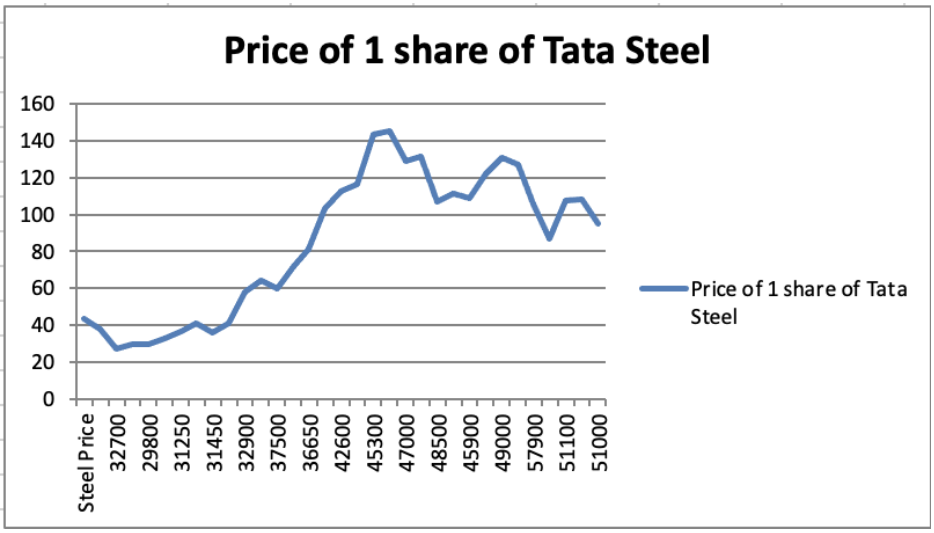
$$r = \frac{33 \times 1.012 \times 10^6 - 2730.62 \times 10436}{\sqrt{33 \times 279767.035 - (2730.62)^2}\sqrt{33 \times 3.80 \times 10^6 - (10436)^2}}$$

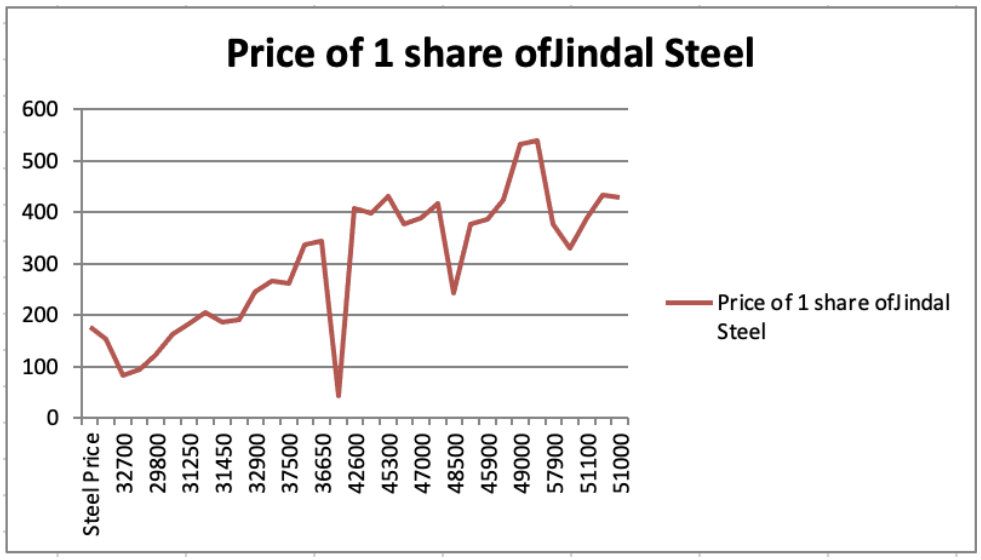
$$r = 0.903$$

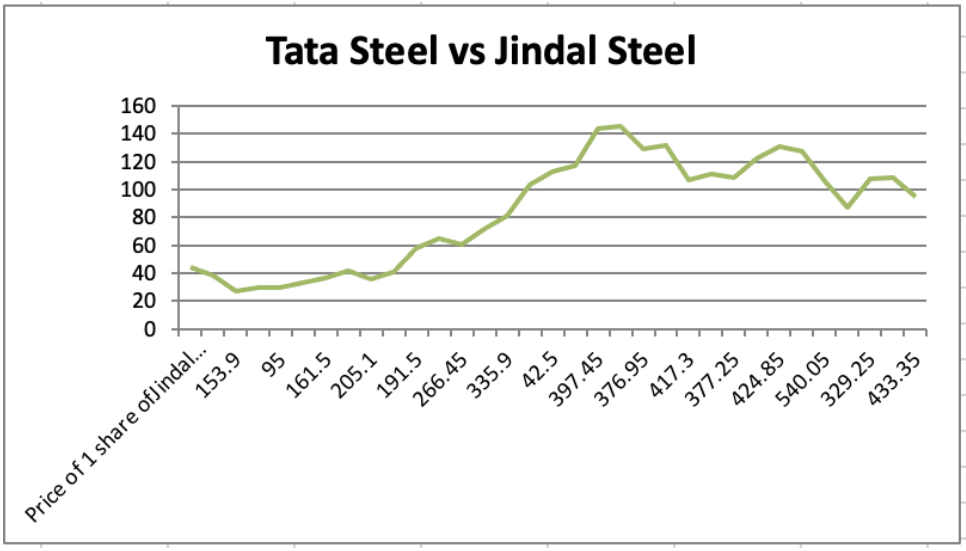
Therefore, highly correlated. The correlation is positive

Finally, Share prices of TATA Steel and Jindal Steel are independent of Steel prices but their share prices have a high positive correlation.

Month	Steel Price	Price of 1 share of Tata Steel	Price of 1 share ofJindal Steel
Jan-20	32850	43.87	175.9
Feb-20	32700	38.18	153.9
Mar-20	32000	26.96	82.8
Apr-20	29800	29.83	95
May-20	29800	29.52	121.55
Jun-20	31250	32.67	161.5
Jul-20	30550	36.63	184.85
Aug-20	31450	41.3	205.1
Sep-20	33500	35.98	186.85
Oct-20	32900	41.06	191.5
Nov-20	34500	57.74	244
Dec-20	37500	64.37	266.45
Jan-21	41300	60.1	261.75
Feb-21	36650	71.52	335.9
Mar-21	40900	81.19	343.6
Apr-21	42600	103.4	42.5
May-21	45000	112.57	407.2
Jun-21	45300	116.66	397.45
Jul-21	43000	143.43	431.75
Aug-21	47000	145.03	376.95
Sep-21	48300	128.89	389.25
Oct-21	48500	131.6	417.3
Nov-21	45800	107.12	242.55
Dec-21	45900	111.15	377.25
Jan-22	46500	108.56	386
Feb-22	49000	122.08	424.85
Mar-22	53500	130.72	532.85
Apr-22	57900	127.11	540.05
May-22	48100	105.57	377.85
Jun-22	51100	86.71	329.25
Jul-22	53900	107.6	389.05
Aug-22	51000	108.3	433.35
Sep-22	50500	95.2	428.6


Price of 1 share of Tata Steel
160
140
120
100
80
60
40
20
0
Steel Price
32700
29800
31250
31450
32900
37500
36650
42600
45300
47000
48500
45900
49000
57900
51100
51000
Price of 1 share of Tata Steel


Price of 1 share ofJindal Steel
600
500
400
300
200
100
0
Steel Price
32700
29800
31250
31450
32900
37500
36650
42600
45300
47000
48500
45900
49000
57900
51100
51000
Price of 1 share ofJindal Steel


Tata Steel vs Jindal Steel
160
140
120
100
80
60
40
20
0
Price of 1 share ofJindal...
153.9
95
161.5
205.1
191.5
266.45
335.9
42.5
397.45
376.95
417.3
377.25
424.85
540.05
329.25
433.35

CONCLUSION

From the research paper, it is evident that share prices of Tata Steel and share prices of Jindal Steel and Power do not get effected by increase and decrease in Steel prices. Though Tata Steel share prices and Jindal Steel and Power share prices are highly correlated and have a positive relationship. Therefore, this theoretical analysis, we can conclude share market doesn't have impact of industry but real

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