# THE INTERPLAY BETWEEN COVID-19 PANDEMIC ON THE STOCK AND COMMODITY MARKETS (MCX)

A Thesis submitted in partial fulfilment for the Degree of

Masters in Economics

in the Name of Goa Business School, Goa University


BY

Pragya Kharwar

MA Part II Economics

Goa University

Goa

June 2021

# DECLARATION

I, Pragya Kharwar declare that this thesis represents work which has been carried out by me, and the same has not been submitted, either in part or full, to any other university or institution for the award of any other degree, diploma or other such titles.

Pragya Kharwar

Place: Taleigao Plateau.

Date: 10-06-2021

# CERTIFICATE

I hereby certify that the above Declaration of the candidate, Pragya Kharwar is true and the work was carried out under my/our supervision.

Dr P. Mukhopadhyay

Professor in Economics

Goa Business School

## ACKNOWLEDGEMENT

*I wish to thank all the people whose assistance was a milestone in the completion of this research work.*

*First of all, I would like to express my sincere appreciation to my research guide, Dr Pranab Mukhopadhyay Department of Economics, Goa University, for convincingly guiding me through his thoughtful comments and recommendations on this research work and also continuously providing encouragement to be professional and always willing and enthusiastic to assist in any way he could throughout the research work. Without his persistent help, the goal of this research work would not have been realized.*

*I am also thankful to the members of faculty of Economics department, Dr P.K. Sudarshan Vice Dean of Goa Business School, Dr S.M. Naronha, Dr B.P. Sarath Chandran, Assistant professor Heena Gaude and Avina Atchut Kavthankar, for their moral support.*

*I wish to acknowledge the great support and love of my family and friends. They kept me going on and this work would not have been possible without their input.*

*Pragya Kharwar*

*June 2021*

## Table of Contents

Page No

## List of Tables

## List of Graphs

# CHAPTER- I

# INTRODUCTION

## 1.1 INTRODUCTION

The outbreak of coronavirus has caused a pandemic, countries are suffering from the COVID-19 pandemic, affecting both the health and economic sectors in the world economy. The negative impact of the recent coronavirus disease (COVID-19) outbreak on the world economy and capital markets is inevitable. COVID-19 is an infectious disease caused by a newly discovered coronavirus. As reported by the World Health Organization (WHO), at the initial stage people who were infected with the COVID-19 virus undergo respiratory illness and recover without requiring special treatment (WHO, 2020). The first case of COVID-19 was confirmed in Wuhan city in Central China on 31 December 2019. Later, in January 2020, the WHO declared the COVID-19 outbreak a public health emergency of international concern. After the 13-fold spread of the deadly COVID-19 cases outside China, the WHO declared COVID-19 a pandemic. However, the WHO guidelines on spread and cure keep changing regularly due to a lack of sufficient scientific knowledge about COVID-19. The outbreak of COVID–19 has shaken the global financial markets, commodity markets, economic activities, employment and GDP of the countries. If anyone can accurately predict the price volatility in the stock market or commodity market, then they have the chances to earn higher returns by developing appropriate investment strategies (Meher, Hawaldar, Mohapatra and Sarea, 2020)

India is the country with the second largest population in the world. According to World Bank statistics, India is a home of 176 million poor citizens and has the lowest ranks in the world for

cleanliness and medical services, and the spreading of COVID-19 has ruined India and its economy. The first case reported in India was on 30 January 2020.

The global economy was hit by the COVID-19 pandemic, and India was one of the countries affected. All came to a halt in India after the government imposed a lockdown. The crashing of the global market system, a big decline in oil prices, and rising unemployment are some of the impacts of the pandemic COVID-19 that impacted almost all countries in the world. The leverage effect of COVID-19 has been considered in the study as the novel coronavirus (COVID-19) pandemic has affected both demand and supply of commodities due to lockdowns, shutdowns and interruptions to supply chains which also lead to economic growth a standstill (Baker McKenzie, 2020). The effect of COVID-19 was seen on India's economic growth, development, economy, and the stock market.

After the Indian Government began with LPG (Liberalization, Privatization, and Globalization) Indian economy have increased the degree of integration of the Indian capital market with the rest of the world market, and that necessitates undertaking major transformations and reforms in the stock markets of the country in terms of establishment of the Security and Exchange Board of India (SEBI), the introduction of disclosure norms, dematerialization of securities, online trading with a worldwide network, increasing participation of foreign institutional investors, allowing 'value at risk' based margin trading, reduction in rolling settlement period from T+5 to T+2, the introduction of new financial instruments and so on. With these landscapes like changes in the Indian financial sector, the volume of trading has increased significantly making the Indian capital market as a developed market and also the largest among emerging markets.

Indian Stock market has seen an enormous change. Volatility is an important phenomenon for any asset market, particularly, for stock markets. Stock markets with their primary and secondary sectors contribute the corporate and the Government to raise funds, they can allocate capital to its highest value users so that returns are maximized subject to their tolerance for risk. Stock markets encourage savings, capital formation, and investment, which are essential for economic development. This helps investors to diversify their investment and thus reduce the risk the investors have to bear, reduce also the cost of capital and facilitate investment and economic growth. Investors carefully watch the performance of stock markets by observing the composite market index, before investing funds. The market index provides a historical stock market performance, the yardstick to compare the performance of individual portfolios, and also provides investors for forecasting future trends in the market. However, the effectiveness of the stock market in economic development is ultimately determined by its volatility and market efficiency. Inefficiency in the stock market may arise due to operational inefficiency and also due to the opportunistic activities of the cash as well as derivatives market players leading to pricing inefficiency. In the event of a lack of efficiency in a stock market, investors face difficulty in choosing the optimal investment and the resulting uncertainty may induce investors either to withdraw from the market till this uncertainty prevails or make them reluctant to invest funds for the long term. On the other hand, volatile security markets lower the investors' confidence and disturb also the primary market resulting in the reduced collection of new funds by the issuers, implying capital market inefficiency in raising and collecting funds. All these will dishearten the investors to invest their savings in the stock market, and hence deter economic growth. Therefore, increasing stock market volatility is not desirable since it unfavorably affects the

growth of firms, generation of employment, and eventually, the economic prosperity of a country.

This study takes into consideration commodity market- Gold Price, Silver Price, Oil Price, Cotton Price and Natural gas and two widely used composite indices of the stock market of India – Sensex and Nifty50 and the rising cases of COVID-19 in India. The period of study is from 1st January 2019 to 19th March 2021.There has been a great deal of attention between analysts, policymakers and investors over the last two decades in the relationship between commodity and capital markets. Equity and commodity markets are being intertwined and correlations of commodities and shares have been increasing since the beginning of the 2000s.

The reasons to choose this paper are based on a many factor. First and foremost, commodities are traded in commodity markets both as a financial instrument and as raw materials used in the production of final commodities. In order to diversify trade, commodity markets are often used as part of the portfolio diversification approach. Increased investor presence in commodity markets leads to spillover impacts from external commodity markets. The volatility of each commodity is influenced partly by a higher return of oil, and that the indexed commodities experienced a higher increase in volatility. Secondly, commodity prices, since they influence the overall price level of the economy, tend to be significant in general. For instance, gold prices receive great attention from the monetary authorities, so gold prices begin to rise as people move from currencies to gold as a hedge against inflation. Likewise, price fluctuation in crude oil was seen as having a considerable effect on economic growth and many other macroeconomic variables, including inflation, spending and performance. Thirdly, the prices of commodities often play a key role on the stock system, as they are used as commercial financial instruments.

Market participants as well as policy makers focused on the dynamics of commodity price volatility because of its impact on economic growth and financial development. Increased commodity in prices generally are the result of increased demand and economic growth. The increased manufacturing costs as a result of a rise in commodity prices including crude oil, gold and silver used as inputs to manufacturing process are often negatively impacted by company earnings. In response, this would have a negative impact on equity markets.

## 1.2 Need of the Study

The COVID‑19 outbreak is first and foremost a human tragedy, affecting whole country. Therefore, many countries adopted lockdown and restrict their economic instruments, due to the transmittable COVID‑19, from one nation to another, even within the country. Due to flight cancellation, restraint on labor movement and stock market instability, collapse in oil prices, it is turning into a global economic crisis. The loss of income due to an outbreak may result in poverty spots, missed meals for children, and reduced access to health care for vulnerable families.

This global epidemic crosses over 200 nations, including India. The virus has been increasing every day in India and has sparked questions about its economic effects. The purpose of this analysis is to evaluate the impact of the COVID-19 epidemic on commodity and stock markets in India. In the context of both policy makers and the investors, an assessment of the actions of the intersection of the two markets during the pandemic seems important. It appears to be significant from the perspective of an investor who wants to reduce their risks and maximize their profits by diversifying their portfolio and hedging risks.

## 1.3 Research Objectives

The objectives of this study are as follows:

- To analyze the effect of Covid-19 on stock market and commodity market.
- To identify the relation between covid-19 cases, variables of commodity market and the stock market of India.
- To examine the existence of correlation between Covid-19 Cases in India, stock market index.

## 1.5Scope of Study

- We use some indicative variables from the commodity market and the stock market in India, namely Crude Oil Prices, Gold Price, Silver Price, Cotton Price, Natural Gas, NIFTY 50 and Sensex.
- Our study covers a period of 2 years (January, 2019 to March 2021).

# CHAPTER-II

# LITERATURE SURVEY

Finance plays an important role in the economy and impacts on real variables in multiple ways. In India, just roughly 2% of the overall population is active in the commodity and stock markets

The study of **Bharat Kumar Meher1, Iqbal Thonse Hawaldar2 *, Latasha Mohapatra3, Adel M. Sarea4 (2020)** – analyzed The Impact of COVID-19 on Price Volatility of Crude Oil and Natural Gas Listed on Multi Commodity Exchange of India, the study period was May 01, 2017 to April 30, 2020, estimated how an asymmetrical volatility in the price of crude oil attributable to COVID-19 expansion. The graphs of crude oil prices showed that uncertainty is likely to increase in the future. The estimated future instability of natural gas prices can hardly be predicted, given how highly fluctuating the volatility graph is. Crude oil and natural gas investors in the commodity market will make the investment decisions through the formulated models. The effect on price fluctuations of the COVID -19 pandemic and to develop effective policies on crude oil and natural gas and risk minimization Strategies. Their studied shows that the pandemic COVID-19 has impacted severely the price volatility of crude oil and absence of leverage effect of COVID-19 on the price volatility of natural gas.

**Dr. Amar Yadav (2020)**- studied Covid19 Impact on Twelve Sectors of The Indian Economy. The study period was January 30, 2020 to June 30, 2020 and dataset twelve sector are auto, banks, financial services, fast moving consumer goods, information technology, media, metal, oil & gas, pharmaceutical, public sector banks, private banks, realty sector using the correlation regression. Sectoral index of bank nifty, financial services, media, pushback, private bank have negative correlation with growth in confirmed cases, whereas only oil gas and pharma have positive correlations with number of deaths. Financial services and realty have negative correlations with growth in number of recovered cases. Psu bank has a negative correlation with growth in active cases. And it also shows regression results indicate that Covid-19 cases do not significantly impact the daily returns of sectoral indices, with only exception being the growth in number of deaths which impacts significantly.

**Paramita Mukherjee, Samaresh Bardhan (2020)-** analyzed the Impact of COVID-19 on Interactions among Stock, Gold and Oil Prices in India, the study period was 2017-2020.The paper employs ARDL model in order to estimate the long-term relationships and Pairwise Granger Causality Test. Their studies show that during the pre-COVID period, there is no cointegration for both Sensex and Nifty with the commodity prices and their volatilities. But, during the post-COVID period, bound tests indicate that there is cointegration among the variables for both Sensex and Nifty. The causality tests showed there is no causality between BSE return and gold price volatility and the causality from crude oil price to BSE return is still observed.

**Rashmi Chaudhary, Priti Bakhshi and Hemendra Gupta (2020)-** discusses the performance of the Indian stock market during COVID-19, the period of study is January 2019 to May 2020, GLS regression has been applied to assess the impact of COVID-19. Their findings show, that COVID-19 has led to an increase in Indian stock market volatility.

**K. P. Prabheesh, Rakesh Pradhan and Bhavesh Garg (2020)-** analyzed the study on COVID-19 and the Oil P VID-19 and the Oil Price – Stock Mark e – Stock Market Nexus, a DCC-GARCH model to find evidence of a positive co-movement. Their result show India's stock price returns exhibit an increase in correlation until about mid-March and remains mostly constant during the post-March period. Next, the Japan's correlation is increasing until about mid-March and remains mainly constant during the post March period. During this time, the coefficients are positive but small, indicating a weak correlation with oil price returns. Then, Korea's correlation is increasing until about mid-March. It remains positive but small thereafter. Overall, stock price returns exhibit a positive co-movement with oil price returns despite falling after mid-March for all the economies except Japan. Specifically, Japan witnessed a positive co-movement between stock price returns and oil price returns and the decline in the correlation was limited.

**ALAM, Mohammad Noor and CHAVALI, Kavita(2020) −** investigated Stock Market Response during COVID-19 Lockdown Period in India, taking A sample of 31 companies listed on Bombay Stock Exchange (BSE), of 35 days of research. The studied positive abnormal returns (AR) around the present lockdown period and confirms that the lockdown has a positive impact on the stock market performance, and the cumulative average abnormal returns (CAAR) is also seen to be significantly positive.

**Farhan Ahmed, Aamir Aijaz Syed, Muhammad Abdul Kamal, Maria de las Nieves López-García, Jose Pedro Ramos-Requena and Swati Gupta (2021)-** The paper examines the impact of COVID-19 on the Indian stock and commodity markets during the different phases of lockdown. In addition, the effect of COVID-19 on the Indian stock and commodity markets during the first and second waves of the COVID-19 spread was compared. A comparative analysis of the stock market performances and sustainability of selected South Asian countries is also included in the study, which covers the lockdown period as well as the time frame of the first and second waves of COVID-19 spread. Welch test, heteroskedastic independent t-test, and the GMM multivariate analysis is employed, on the stock return, gold prices, and oil prices. The results show, that novel coronavirus has created a severe negative impact on the Indian stock and commodity markets during the first wave, compared to the second wave of COVID-19 spread.

**Debakshi Bora and Daisy Basistha (2021**)- discusses theCOVID-19 pandemic and its impact on stock market volatility with the help of a generalized autoregressive conditional heteroscedasticity model. The result shows that the stock market especially the BSE Sensex become volatile during the pandemic period. In case of stock index, NSE Nifty, it is found that there is no such significant impact of the COVID-19 period on the volatility of NSE stock prices.

**Saqib Farid, Ghulam Mujtaba Kayani b, c, Muhammad Abubakr Naeem d, *, Syed Jawad Hussain Shahzad (2021) -** they examine the volatility connectivity of equities, including gold, petroleum, silver and natural gas and calculate the intraday volatility estimates using the well-known MCS GARCh model for superior and stable estimates of cyclic volatility. Further, they construct the volatility connectedness network of assets using Diebold and Yilmaz (2012) spillover index approach. In addition, they documented the time-varying dynamics of volatility spillovers among the underlying assets before and during the virus spread, which unveils the outbreak effects on US financial markets. They have divided their research in parts, first they find out that the stocks and gold are two largest contributors of volatility shocks to the volatility connectedness network, next was COVID-19 outbreak period also reveals that US stock market continues to act as the largest transmitter of volatility spillovers to major commodity markets in the US. Investors regard the US equities market as a leading indication of the US economy's economic and financial circumstances, according to the data. Third finding they notice that volatility connectivity among US financial markets peaked during the virus spread phase, their

dynamic analysis verifies the strong influence of the COVID-19 pandemic on volatility spillovers among assets. Across alternative asset classes, the findings show that investors have less options for portfolio diversification and hedging. Fourth, that natural gas is least connected to other assets.

**Debi Bal and Seba Mohanty (2021)-** this paper discusses Sectoral Nonlinear Causality Between Stock Market Volatility and the COVID-19 Pandemic, the linear Granger causality test is been used to estimates the favourable outcomes. The results show that there exists a bidirectional linear causality between variation in the volatility of oil and gas (VOLOG) is higher than the variation in the volatility of metal (VOLM), volatility of moveable consumer goods (VOLMC) and the volatility of health care (VOLHC) to the growth rate of COVID-19.

In the next chapter we discuss about the selection of the variables and data sources followed by variables description, setting the hypothesis and discussed about methodology adopted.

# CHAPTER- III

# DATA BASE AND METHODOLOGY

In this chapter we discuss the variables used in our study, (iii) data resources used, (iv) data collection techniques, and (v) methodology used for analysis.

## 3.1 Variables Selection and Data Sources

We have used secondary data for our analysis. The study was conducted for a time period ranging from January 2019 to March 2021 using daily data the following are the sources of data collection:

1. Nifty50 and Sensex: Data on closing prices of NIFTY 50 index and Sensex has been collected from official website National Stock Exchange (https://www.nseindia.com/) and Bombay Stock Exchange (https://www.bseindia.com/)

2. Gold and Crude Oil Rate: Data on gold and crude oil prices has been collected from official website of Multi Commodity Exchange (https://www.mcxindia.com/) and RBI website (http://dbie.rbi.org.in)

3. Cotton, Silver and Natural Gas Price: Data on cotton, silver and silver prices has been collected from official website of Multi Commodity Exchange (https://www.mcxindia.com/).

## 3.2 Description of Variables

| Symbol | Variable | Base Year | Units |
|---|---|---|---|
| IC | India Cases (new cases- 40,953) | Actual Value | Per day cases |
| GP | Gold Price | Actual Value | Rupee per 10 gm |
| SP | Silver Price | Actual Value | Rupee per kg |

| | | | |
|---|---|---|---|
| CO | Crude Oil Rate | Actual Value | Rupee per BBL |
| CP | Cotton Price | Actual Value | Rupee per Bales |
| NG | Natural Gas | Actual Value | Rupee per MMBtu |
| NIFTY | NIFTY 50 | 1995=100 | Closing price in rupees |
| Sensex | Sensex | 1995=100 | Closing price in rupees |

## Covid19 India cases

India has confirmed COVID-19 cases of 11,555,284, where out of these active cases there are 8,095,636, and total deaths are 114,033, as per the data released by the Ministry of Health and Family Welfare, Government of India by the time of completing this study (19th March 2021).

## Indian Commodity Market

## Gold Price

Gold play an important part of investment portfolios for individuals as well as for institutions, investors commonly buy gold in a manner of diversifying risk, mainly by the futures contracts and derivatives. Gold is termed as an alternative investment opportunity for investor in India. Indian investors are willing to invest less in stocks with rising gold prices, hence the stock prices fall. The inverse relation between the price of gold and stock can be calculated. It is of paramount significance that this economic indicator is added to the study.

## Silver Price

Silver is a valuable metal, and the spot price represents not only the current market price but also the current supply and demand. It represents investors predictions of future inflation and other general business/economic situations, as well as supply and demand circumstances. Silver differs from other commodities in that it has a wide spectrum of uses and that demand for it can fluctuate dramatically owing to a variety of factors. Silver, for example, may be changed from its natural condition and utilized to make solar energy, water purification, and X-Ray equipment in the technological and medical industries. Silver is also utilized to make computer components and antifreeze materials in the electronics and vehicle industry. Silver may also be used as an investment vehicle by investors who want to make money, diversify their portfolio, or hedge their bets. Because of its numerous industrial and investment applications, silver's price has the potential to be more volatile than other commodities.

## Crude oil

Crude oil is a key development element, its prices are added to the current economic activity. Since India imports crude oil, it plays an important role in the Indian economy. Indian oil and gas sector are highly regulated by the Ministry of Petroleum and Natural gas. The Government of India declared the Oil industry in India as the core industry under the industrial policy resolution Bill in the year 1954. In pursuance of the 1954 Industrial Policy Resolution, Government owned National Oil Companies ONGC (Oil & Natural Gas Commission), IOC (Indian Oil Corporation), and OIL (Oil India Ltd.). Crude oil is used widely in differ ways, it is used as a petroleum product, Aviation Turbine Fuel (ATF) and Liquefied Petroleum gas (LPG).

## Cotton Price

The cotton is considered as most and major agriculture commodity product. India is one of the world's foremost cotton producers. Being a fiber crop, it is mostly utilized for the textile industry as a raw material (55-60 percent of requirements). It is one of the most traded commodities in the world because of its wide scale of usage. In terms of production, India invariably ranks second / third and is also the world's second largest exporter.

## Natural Gas

Natural gas is closely linked to economic growth in contrast to financial assets as it is an energy commodity, which is widely used for diversification. It is used in vehicles in the form of CNG (Compressed Natural Gas). It is also used to manufacture a few chemicals and fertilizers. The gas is used as a source of energy for cooking, heating, and electricity generation.

## Indian Stock Market

## Nifty 50 Index

Nifty50 was launched as a National Stock Exchange Benchmarking Index in 1996. National Index Fifty is the expanded version of Nifty50. It reflects or consists of 50 Indian stocks representing 13 sectors as one of the largest stock indexes in India. It is computed by taking a base value of 1000 for year 1995 as a weighted average of the firms it comprises. BSE Sensex is the other big index. Nifty50 offers a wider perspective, though. Just certain firms of Indian

descent are included and included in the estimation of Nifty50 index. In its estimates it is representative of the main industries, as IT, oil & automotive sectors are highly weighted. It consists only of highly liquid securities and is weighed by free float market capitalization on all stocks or elements of the index. The index indicates a gross free float market cap of 75% overall. That indicates that the weight of index calculations by companies with higher free float market cap is greater and has thus a larger effect on the Nifty50 index movement. For instance, Reliance Industries Limited exceeds Nestlé and thus has a higher index effect than Nestle.

Index movement determines how prices shift in most of the stock. When the index goes up, most stocks in its stock prices display upwards and vice versa. From the perspective of traders, the index helps to take decisions from the market as a whole or to hedge and speculation practices, but from the point of view of analysts, the index represents the overall market as a whole.

## Sensex Index

SENSEX stands for "sensitive index," and it is an indication of the top thirty firms on the Bombay Stock Exchange (BSE) market, which are selected by a committee based on a set of criteria from various sectors of the economy. In fact, it gives us a general idea about whether most of the stocks have gone up or down. It is regarded as a measure of India's capital market's economic condition. It is established in 1875, it is Asia's oldest stock exchange. BSE is the largest of India's 30 stock exchanges, with over 5000 businesses listed, and is the world's ninth largest exchange, with a market capitalization of US$3.1 trillion.

## 3.3 Statement of Hypothesis

The hypothesis for this study has been stated below:

### Null Hypothesis:

H0: There is no significant relation between India Covid19 cases and Gold price

H0: There is no significant relation between India Covid19 cases and Silver

H0: There is no significant relation between India Covid19 cases and Cotton

H0: There is no significant relation between India Covid19 cases and Crude oil

H0: There is no significant relation between India Covid19 cases and Natural gas

H0: There is no significant relation between India Covid19 cases and NIFTY 50.

H0: There is no significant relation between India Covid19 cases and Sensex.

### Alternate Hypothesis:

H1: There is a significant relation between India Covid19 cases and Gold price

H1: There is a significant relation between India Covid19 cases and Silver

H1: There is a significant relation between India Covid19 cases and Cotton

H1: There is a significant relation between India Covid19 cases and Crude oil

H1: There is a significant relation between India Covid19 cases and Natural gas

H1: There is a significant relation between India Covid19 cases and NIFTY 50.

H1: There is a significant relation between India Covid19 cases and Sensex

## 3.4 Segmentation of lockdown

| Phases of Lockdown | Dates |
|---|---|
| No lockdown (No COVID) | 1 January to 20 March 2020 |
| 1st Lockdown (Phase 1) | 23 March to 14 April 2020 |
| 2nd Lockdown (Phase 2) | 15 April to 30 April 2020 |
| 3rd Lockdown (Phase 3) | 1 May to 18 May 2020 |
| 4th Lockdown (Phase 4) | 19 May to 31 May 2020 |
| 5th Unlock phase (Unlock) 1 | 1 June to 20 July 2020 |
| First Wave of COVID infection | 23 March 2020 to 30 November 2020 |
| Second Wave of COVID infection | 1 February 2021 to 19 March 2021 |

Sources: own table

In the table it reflects the dates of various lockdown phases imposed by the Indian Government to curtail novel coronaviral infection and of the first and second wave timeline COVID-19. In new coronaviruses, the time line for the first and second waves is chosen depending on the rise and fall, it was around July-August and, from the end of November, country witnessed a drop in the peak. Thus, we took the first wave until 30 November 2020 to ease the contrast. Likewise, country have witnessed another steep rise in the number of COVID-19 cases; early February 2021 as the onset of the second wave.

## 3.5 Methodology Adopted

Different methods have been adopted with the aim of achieving the goals of our study. First of all, to fulfill the research objectives, descriptive statistics like standard deviation, coefficient of determination, mean, etc. are carried to show the nature and basic characteristics of the variables used in the analysis. Correlation is the next step to move towards the objectives of this study and finding any relation between the Covid19 cases and Indian stock market and commodity market. The formal research is then carried out by examining the stochastic properties of the variables and testing the stationarity of the variables using the Unit Root Test. Augmented Dickey Fuller (ADF) is a widely used approach in this area. If the variables don't have unit root problem then Granger causality can be estimated. Let's take a close look at these two methods for determining the stochastic aspects of variables.

Consider here two variables such as X and Y for methodological discussion relating to the study. If the calculated Augmented Dickey-Fuller (ADF) statistics is less than its critical value, then X is said to be stationary or integrated to order zero, i.e., I (0). If this is not the case, then the ADF test is performed on the first difference of X (i.e., $\Delta X$). If $\Delta X$ is found to stationary then X is integrated order one i.e., I (1). If two variables X and Y are both integrated to order one I (1), then the next step is to find out whether they are co integrated. This can be done by using co-integration regression Durbin-Watson approach. If the two variables are not cointegrated then the best approach is to find out the causality between them by using Granger test, which only

establishes short run relationship. In practice, however, a number of econometric packages can be used to perform these tests which also give the critical values of the ADF statistic. To decide that how much lag length is required for the model selection Akaike information criteria (AIC), and the model with lowest value of AIC preferred.

## **Engle –Granger Causality**:

Granger Causality Test, introduced in the year 1969 by Clive Granger, based on the assumption that one time series is useful in forecasting another. The following is the model adopted in the study to empirically examine the above said hypothesis. Let's start by defining Granger's concept of causality. A variable Yt is said to be Granger cause Xt if Xt can be predicted with greater accuracy by using past values of Yt variable rather than with not using such past values of Yt, all other things remaining constant. Similarly, X is said to be Granger cause Y if Y can be predicted with greater accuracy by using past values of X. Consider the following equation:

$$\mathbf{Yt = \alpha 0 + \alpha 1\ Yt\text{-}1 + \beta 1\ Xt\text{-}1 + ut}$$

If $\beta 1 = 0$, X does not Granger cause Y. If, on the other hand, any of the $\beta$ coefficients is non-zero, then X does Granger cause Y. The null hypothesis that $\beta 1 = 0$ can be tested by using the standard F-test.

Note that it has been taken one period lag in the above equation. In practice, the choice of the lag is four (4). Varying the lag length may lead to different result. As a practical guide, one can include as many as are necessary to ensure non-auto correlated residuals.

## Statistical test

R-square: It is also known as the coefficient of determination which tells how the regression line best fits the data. It measures the percentage change in dependent variable that is explained by the explanatory variables.

F- test: It indicates whether or not the model as a whole is important. It shows how significant the model is. It depicts the combined effect of all explanatory factors on the dependent variable.

T-ratios: It measures the dependability of individual variables and their influence on the dependent variable. The corresponding p-value is used to decide whether to accept or reject the null hypothesis. We reject the null hypothesis when the p value is smaller than the alpha value. If the null hypothesis is rejected, we can say the results are statistically significant. In the next chapter, we have empirically estimated the effect of Covid19 on stock market and commodity market by adopting the above-mentioned econometric techniques.

# CHAPTER-IV

# EMPIRICAL ANALYSIS

## 4.1 Introduction

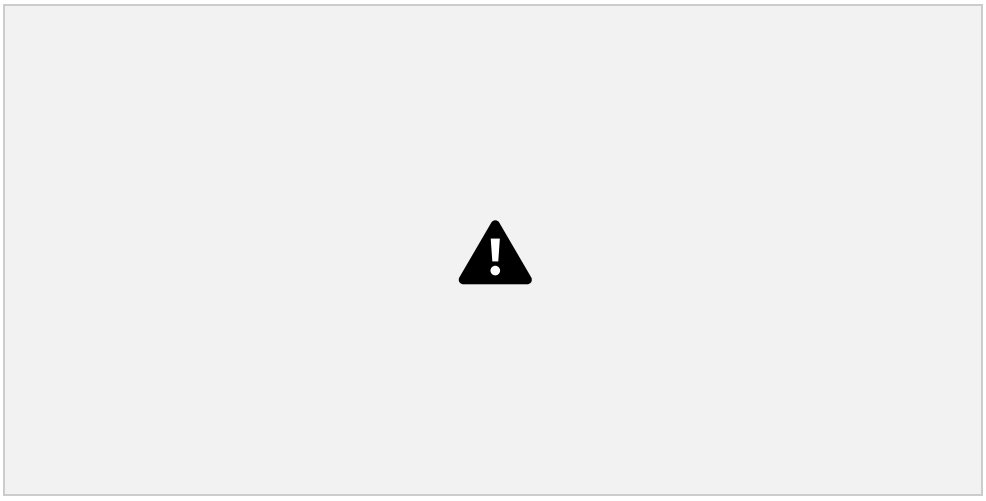
Since the objective of this research work is to study the Covid19 Impact on Indian stock market and commodity market, so the detailed portrayal of variables taken up in the study and the impact of them has been done with the help of various statistical and econometric tools.

## 4.2 Trends of all Variables and Covid19 cases

To examine the impact of COVID-19 on the Indian stock and commodity market, we have taken the daily closing price data of the National Stock Exchange index (NSE) and Nifty50 and closing prices of gold, silver, cotton, crude oil and natural gas from the Multi Commodity Exchange (MCX) of India. The period of study is for two years and two months, dated from 1st January

2019 to 19th March 2021. To analyze this analysis in detail, it is necessary to understand the fundamental trend following these variables through the study period, in order to understand all significant variations in the variables, if any.

**Figure 4.1: Trend of India Covid19 cases**



In India, the first COVID-19 case was found in Kerala in January 2020, but safety measures were introduced from March 2020 onwards when the cases started rising after that World Health Organization declared it as a global pandemic. In the given figure 4.1 it shows how drastically the cases of India increases towards March onwards and it was on peak in the month of September and October 2020. But, after that there we can see the coronavirus case stared declining towards end of year 2020, precisely the first wave of the COVID-19 spread in India was subdued during the first week of November 2020. Currently, India is witnessing the second wave of coronavirus infection, which is more severe due to the high death rate compared to the first one. It is said the second wave of coronavirus has stared from February 2021. Therefore, we can see the rise in the cases in the above figure from February 2021.

**Figure 4.2: Trend of Gold price**

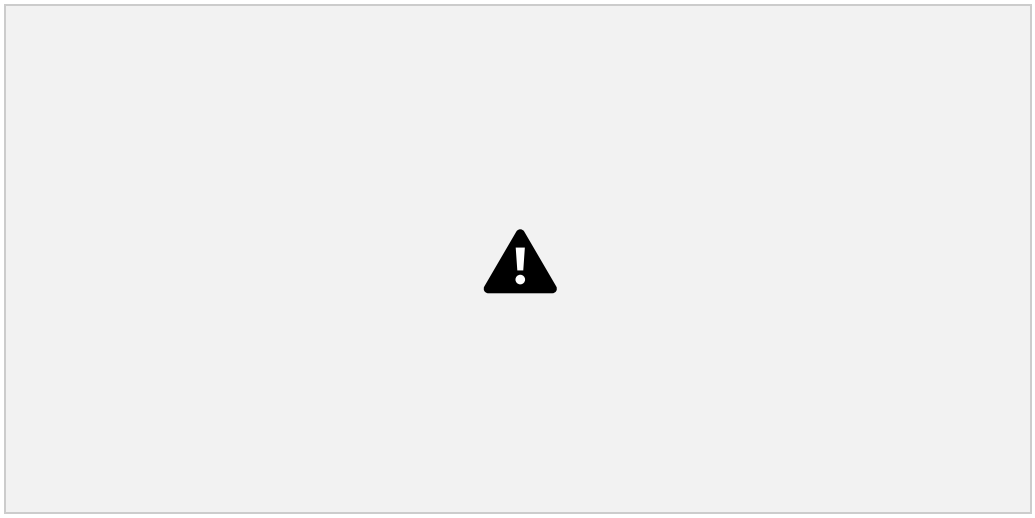
India, the gold-loving county, has a larger love for metal and has been the second largest consumer country in the world. As an investment opportunity and a luxury commodity, it has a dual character. Gold's worth has increased dramatically over the years due to the country's high demand and making it one of the safest bets to invest in as an asset. There are several reasons for high demand of gold. The first is that gold may be used as collateral for loans, and the other reason for the strong demand for gold is the liquidity given by gold investments. Gold is a dollar-dominated market, making it an even more appealing investment in tumultuous times. The increase in gold prices in the rupee is attributable to two primary factors: an increase in

worldwide gold prices and a strengthening of the dollar versus the rupee. From the perusal of the figure 4.2, one can notice that the price of gold is rising throughout the year and it was stagnant for two months which was the 1st lockdown in the country.

**Figure 4.3: Trend of Silver price**

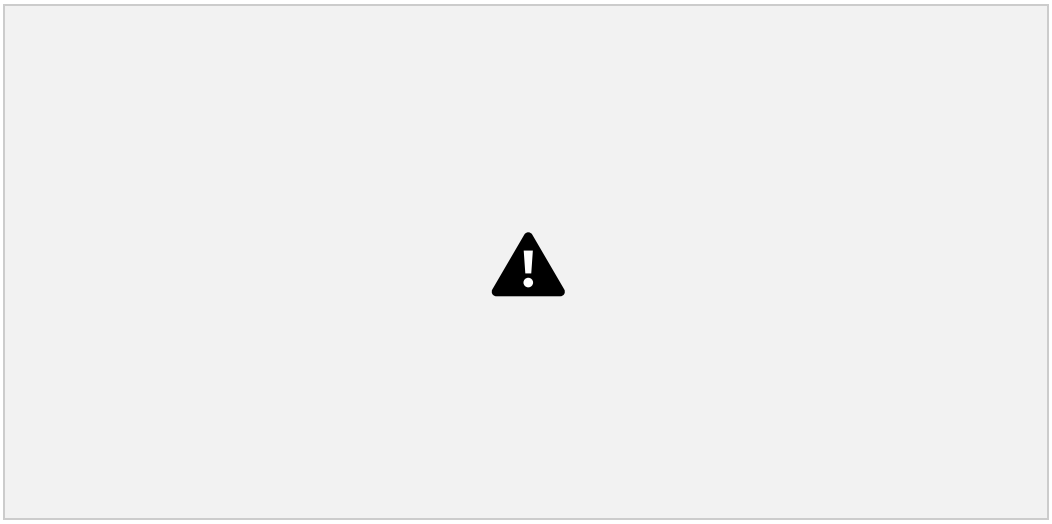
The demand for Silver in India constantly very good. The demand is being generated by both the jeweler sector and industrial sectors. In India silver have a growing demand as it is regarded as the gold of common people who cannot afford gold, it is quite easier to get silver compared to gold. As silver prices keep rising, investors will be able to invest in silver instead of bonds, real estate, etc. Silver is also used for conductivity purposes in dated electronic devices. From the given figure 4.3, the price of the Silver reveals frequently an irregular movement but mainly upwards over the research period, except the lockdown period where the market of silver decline because no trade has been done.

## Figure 4.4: Trend of Cotton price



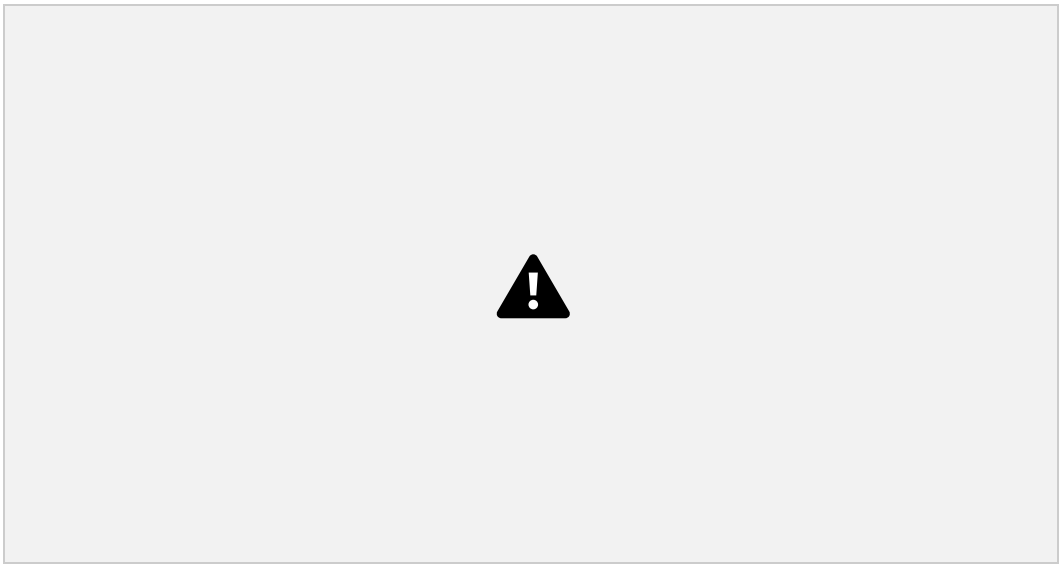
In the case of cotton price, given the figure 4.4 shows that there is a decline in the price of cotton before the coronavirus has hit the India, and it further decreases. But, soon after lockdown, changes in the pattern of price has been noticed and the trend started rising which means the price of the cotton has risen.

## Figure 4.5: Trend of Crude oil



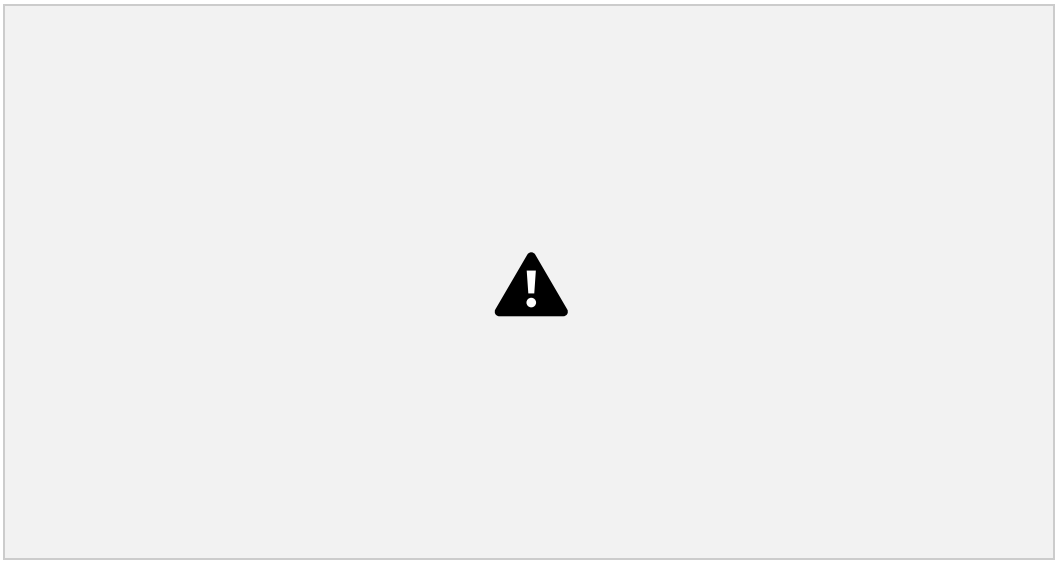
Crude oil is a crucial commodity worldwide. Crude Oil Price changes have a direct as well as an indirect impact on the economies of the various countries. Various modes of transmission exist which oil price fluctuations may affect stock prices and also the economy of country. Changes in crude oil prices are often considered to be an important factor. Whether delayed or suspended is affected by volatility in oil prices for investors' investment decisions. With rise in prices of oil, the healing cost, transportation earnings and cost along with reduced corporate earnings. Consumer consumption is also alarming with a decline in gasoline costs. The financial risk is more the fluctuations in oil prices. For countries that are importers of oil, such as India, the cost of supply has increased with higher oil prices, and future cash flows and stock market have gradually been reduced. Increased oil prices will result in reduced actual economic production, which will lead to lower stock prices. Figure 4.5 shows a greater fluctuation in the price of oil.

**Figure 4.6: Trend of Natural gas**



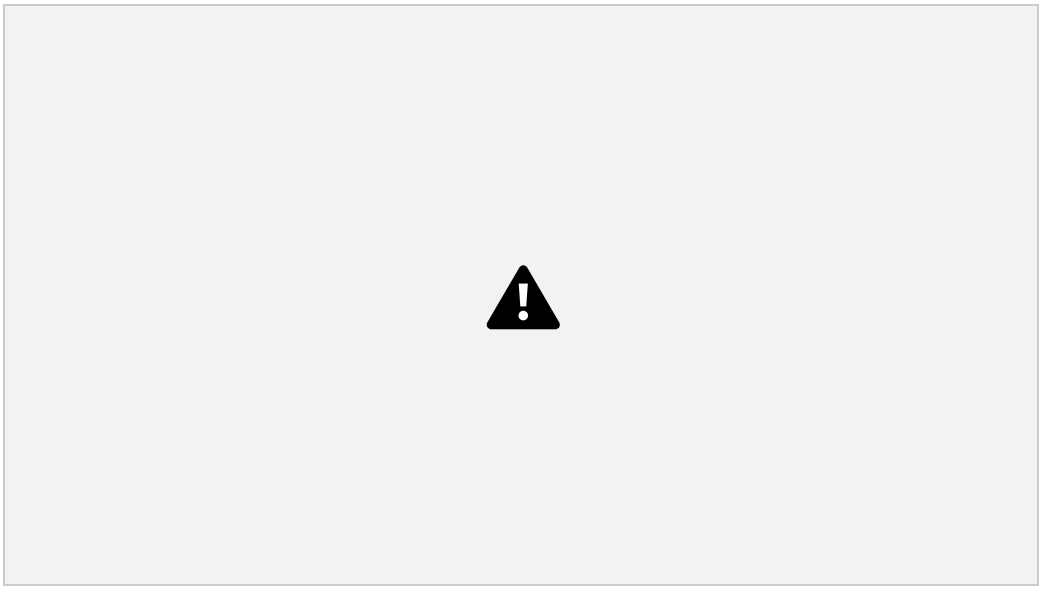
Another variable is Natural gas in the figure 4.6 has revealed incremental fluctuation during the study period. Due to lockdown, there is decrease in the trend of natural gas but after that there was a growth in the price and towards end of year 2020 it showed the price is the highest in the span of study period.

**Figure 4.7: Trend of Sensex**



The BSE SENSEX, which has attracted a lot of attention because to its massive growth and volatility, has been adopted as a benchmark for India's financial market growth It has gathered pace since economic reforms, i.e., from 1990-91 onwards, but massive expansion began in the early 21st century and then it has finally burst. The fundamental motive behind this precarity is the IMF conditionality, which they forced on India in the form of structural changes in loans of billions of dollars in order to avoid bankruptcy in 1990-91. From the perusal of the figure 4.7, one can notice that SENSEX is rising, but, in period of April and May 2020 it declines drastically, and in June 2020, it started rising, it became explosive as it had even touched 50,000 in just one year by March 2021. This pattern thus usually shows an erratic but mostly uphill movement.

**Figure 4.8: Trend of Nifty50**



Capital is often defined as “wealth used in production of further wealth”. Any company that wishes to exist and expand its horizons need capital that can be borrowed for a prolonged period

of time from a country's capital market. The BSE and NSE are the two primary stock exchanges in India where trading takes place. SEBI, the capital markets' watchdog, was founded in 1988 and granted statutory recognition in 1992, and had the task of creating an environment which would facilitate the mobilization and efficient allocation of enough resources via the stock markets, all this together with growth in the public confidence, underwriting, credit rating and development banks. From the perusal of the figure 4.8, one can notice that the pattern of Nifty50 generally indicates an irregular but largely upward tendency.

## 4.3 Descriptive Statistics

Various descriptive statistics are calculated of the variables under study in order to describe the basic characteristics of these variables. In this table various statistics are calculated like mean, median, maximum and minimum value, standard deviation, skewness, kurtosis.

**Table 4.1: Descriptive Statistics**

| | N | Minimum | Maximum | Mean | | Skewness | Kurtosis |
|---|---|---|---|---|---|---|---|

| | | | | | **Std. Deviation** | | |
|---|---|---|---|---|---|---|---|
| India cases | 290 | 0.00 | 97894.00 | 27915.99 | 27326.62 | 0.892233 | -0.30779 |
| Gold | 510 | 31255.00 | 56018.00 | 42178.11 | 6809.394 | 0.028749 | -1.24863 |
| Silver | 510 | 31739.00 | 73752.00 | 49689.82 | 11538.87 | 0.462245 | -1.2786 |
| Cotton | 510 | 15440.00 | 22590.00 | 19284.80 | 2027.081 | -0.30016 | -0.926 |
| Crude Oil | 510 | 887.00 | 4816.00 | 3516.52 | 786.0133 | -0.99908 | 0.731127 |
| Natural Gas | 510 | 111.20 | 246.10 | 167.87 | 28.08362 | 0.163093 | -0.71562 |
| Bse Sensex | 510 | 26674.03 | 52154.13 | 39371.69 | 4874.51 | 0.599586 | 0.667906 |
| Nse Nifty50 | 510 | 7610.25 | 15314.70 | 11691.87 | 1474.407 | 0.311289 | 0.621802 |

Table 4.1, the statistics define several variableness characteristics, as the mean value reflects the average value of all variable values; the maximum and minimum values of the group are also determined along with the standard deviation and skewness that reflect how far a variable is dispersed around its mean value and the asymmetry level of a distribution around its mean value. Kurtosis is not anything but characterizes a distribution's peak or flatness as opposed to normal distributions, where positive kurtosis shows peakedness and negative kurtosis shows flatness of

distribution. The variables are Covid19 cases, gold price, silver price, cotton price, crude oil, natural gas and the two-stock market NSE and BSE.

In the group of 510 observation for all the selected variables and 290 for India's covid19 cases, the mean of India cases is 27915.99, while its maximum is 27915.99 for our data series and the standard deviation is 27326.62.

The mean of share price Nifty50 and Sensex is 11691.87 and 39371.69, its maximum price is 15314.70 and 52154.13 for our data series and the standard deviation is 1474.407 and 4874.51 respectively, which is considered to be high. It reflects significant variability in stock prices (Sensex). Its minimum price is 7610.25 and 26674.03.

Gold price mean is 42178.11 and its standard deviation is 6809.394, whereas the maximum price of gold is 56018.00 for our data series and minimum is 31255.00. There is moderate-high variability in gold prices.

Silver price mean is 49689.82 and standard deviation is 11538.87. 98, which imply that there is a greater degree and even more variability. The maximum and minimum values of silver price are 73752.00 and 31739.00 respectively.

Cotton price has a mean value of 19284.80 with a standard deviation of 2027.081. This shows a moderate variability in CP in India. Its maximum and minimum value is 22590.00 and 15440.00 in given period.

Crude oil mean is 3516.52 and its standard deviation is 786.0133 with its maximum value be 4816.00 and minimum value is 887.00

The mean of natural gas is 167.87 and standard deviation is 28.0836167 implying that there is low moderate variability. Maximum value of NP is 246.10 and minimum is 111.20.

**Table 4.2. Coefficient of variation**

| Variables | Coefficient of variation |
|---|---|
| Gold | −0.125253 |
| Silver | 2.98287 |
| Cotton | −1.12787 |
| Crude oil | −2.27071 |
| Natural gas | 103.840 |
| Sensex | −0.804108 |
| Nifty50 | −10.4329 |

## Coefficient of Variation

Coefficient of Variation shows that among the above-mentioned variables natural gas shows greatest variability while the least variability is shown in silver.

## Skewness

It is the degree of distortion from the symmetrical bell curve or the normal distribution. It measures the lack of symmetry in data distribution.” In the data, gold rate, silver rate, cotton

price, natural gas and nifty50 are fairly symmetrical because their skewness values lie between -0.5 to 0.5. India cases and Sensex have skewness of greater than 0.5 (>0.5). This implies that data are moderately positive skewed (skewed at the right tail). Crude oil skewness is greater than -0.5 (>-0.5), the data moderately negative skewed (skewed at the left tail).

## Kurtosis

Kurtosis is the degree of peakedness of a distribution. The higher kurtosis, the more peaked is the distribution. Such distribution is called leptokurtic and has value greater than 3. A distribution that is less peaked has value less than 3 and is called platykurtic distribution. Here all the variables other India covid19 cases, gold rate, silver rate, cotton price, crude oil, natural gas, in fact nifty and Sensex exhibit platykurtic distribution because their value is less than 3. Distribution with a value equal to 3 is mesokurtic distribution (normal distribution)

### 4.3.1 R-Square

| | | | |
|---|---|---|---|
| R-squared | 0.747 | Adjusted R-squared | 0.740 |

R-Square is the proportion of variance in the dependent variable (India cases) which can be predicted or explained from the independent variables (stock market- Nifty50 and Sensex, commodity market-gold, silver, cotton, natural gas, crude oil). $R^2$ of the model is 0.74 which is good. The model explains 74.7% variation in dependent variable (India new cases of covid19) can be predicted from the stock market and commodity market. R-Square is also called the coefficient of determination. It shows the model fitness of a regression equation

Adjusted R-square – A portion of the rise in R-square would be attributed to chance rather than the predictors. The adjusted R-square tries to estimate the R-square for the population more reliably. The value of R-square was 0.747, while the value of Adjusted R-square was 0.740.

### 4.3.2 t-value and p-value

**Table 4.3 Regression**

Note: Dependent variable is Covid19 new cases of India, * & *** indicates 1% and 10% level of significance

| | ***Coefficient*** | ***Std. Error*** | ***t-ratio*** | ***p-value*** | **sig** |
|---|---|---|---|---|---|
| Const | 33139.0 | 30069.3 | 1.102 | 0.271 | |
| Gold | −0.125 | 0.637 | −0.196 | 0.844 | |
| Silver | 2.982 | 0.356 | 8.362 | 0.000 | *** |
| Cotton | −1.127 | 2.043 | −0.552 | 0.581 | |
| Crude oil | −2.270 | 2.794 | −0.812 | 0.417 | |
| Natural gas | 103.840 | 56.222 | 1.847 | 0.065 | * |
| Sensex | −0.804 | 0.546 | −1.471 | 0.142 | |
| Nifty_50 | −10.432 | 1.922 | −5.426 | 0.000 | *** |

## Beta value

The Beta value in the regression method is used for identifying or predicting the dependent variables. The variables are calculated in their natural unit hence called unstandardized coefficients. Regression equation is as follows:

India Covid19 new cases = f (Gold, Silver, Cotton, Crude oil, Natural gas, Sensex, Nifty 50)

India Covid19 new cases= β1+ β2 Gold +β3 Silver +β4 Cotton +β5 Crude oil +β6 Natural gas +β7 Sensex +β8 Nifty 50

India Covid19 new cases= 33139.0+ (−0.125253) Gold +(2.98287) Silver +(−1.12787) Cotton +(−2.27071) Crude oil +(103.840) Natural gas +(−0.804108) Sensex +(−10.4329) Nifty 50

These estimates tell the amount of increase in dependent variable prices that would be predicted by a 1 unit increase in the predictor variables.

The coefficient of gold rate is −0.125. So, for every unit increase in gold price, a 0.125 decrease in Covid19 cases is predicted holding the other variables constant.

The coefficient of silver rate is 2.982. So, for every unit increase in gold price, a 2.982increase in Covid19 cases is predicted holding the other variables constant.

The coefficient of cotton price is −1.127. So, for every unit increase in gold price, a 1.127 decrease in Covid19 cases is predicted holding the other variables constant.

The coefficient of crude oil rate is −2.270. So, for every unit increase in gold price, a 2.270 decrease in Covid19 cases is predicted holding the other variables constant.

The coefficient for natural gas rate is 103.840, so for every unit increase in natural gas price there will be a 103.840 corresponding increase in Covid19 cases.

The coefficient of Sensex is −0.804. So, for every unit increase in gold price, a 0.804 decrease in Covid19 cases is predicted holding the other variables constant.

Similarly, the coefficient for NIFTY 50 prices is −10.432, so for every unit increase in nifty50 price there will be a −10.4329 corresponding decrease in Covid19 cases

## t value and Sig. (p- value)

The above table shows the t-value and 2 tailed p-value used in testing the null hypothesis. If you use a 2 tailed test, then you would compare each p-value to your preselected value of alpha (0.05). Coefficients having p-values less than alpha are statistically significant, in that case we will reject the null hypothesis.

Gold rate: Its coefficient is not statistically significant because p-value is 0.844 which is greater than 0.05 (alpha level). So, we accept null hypothesis (H0). This means that there is no significant relationship between India Covid19 cases and gold rate.

Silver rate: Its coefficient is statistically significant because p-value is 0.000 which is less than 0.05 (alpha level). So, we reject null hypothesis (H0). This means that there is a significant relationship between Covid19 cases and silver rate.

Cotton price: Its coefficient is not statistically significant because p-value is 0.581 which is greater than 0.05 (alpha level). So, we accept null hypothesis (H0). This means that there is no significant relationship between Covid19 cases and cotton price.

Crude oil rate: Its coefficient is not statistically significant because p-value is 0.417 which is greater than 0.05 (alpha level). So, we accept null hypothesis (H0). This means that there is no significant relationship between Covid19 case and crude oil rate.29

Natural gas price: Its coefficient is not statistically significant because p-value is 0.065 which is greater than 0.05 (alpha level). So, we accept null hypothesis (H0). This means that there is no significant relationship between Covid19 cases and natural gas price.

Sensex: Its coefficient is not statistically significant because p-value is 0.142 which is greater than 0.05 (alpha level). So, we accept null hypothesis (H0). This means that there is no significant relationship between Covid19 cases and Sensex.

NIFTY 50: Its coefficient is statistically significant because p-value is 0.000 which is less than 0.05 (alpha level). So, we reject null hypothesis (H0). This means that there is a significant relationship between Covid19 cases and NIFTY 50.

## 4.4 Stationarity and Causality Analysis

Following all the stationary statistics testing on the variables, first the series has to be made stationary in order to apply the Granger causality. The Augmented Dickey Fuller (ADF) test was used, and all of the series were determined to be stationary at level of significant of 5% after applying the tests.

## Table 4.4 Unit Root (ADF) Tests for variables

| Variables | ADF Statistic |
|---|---|
| Gold | -14.299 |
| Silver | −2.351 |
| Cotton | -3.328 |
| Crude oil | -2.470 |
| Natural gas | -2.594 |
| Sensex | -2.235 |
| Nifty50 | -2.310 |

Note: stationarity at 5% level of significance

In the ADF test that has been conducted on all the variables in the table 4.4 to check their stationarity in order to fulfill the precondition of Granger causality, all the variables were found stationary, i.e., their error term ut is white noise and the hypothesis that coefficient =0 is rejected as the computed absolute value of tau statistic (|τ|) is greater than the DF critical tau values. The lag values were chosen on the basis of AIC criteria, the model with the minimum AIC value was chosen.

## Table 4.5 Granger Causality Test

| Direction of Causality (Null Hypothesis) | F-Statistic |
|---|---|
| In India cases does not Granger cause ln Gold price | 1.219514 |
| In Gold price does not Granger cause ln India cases | 1.395147 |
| In India cases does not Granger cause ln Silver | 1.082031 |
| In Silver does not Granger cause ln India cases | 0.881364 |
| In India cases does not Granger cause ln Cotton | 0.781358 |
| In Cotton does not Granger cause ln India cases | 0.876582 |
| In India cases does not Granger cause ln Crude oil | 0.848294 |
| In Crude oil does not Granger cause ln India cases | 0.881364 |
| In India cases does not Granger cause ln Natural gas | 1.768468 |
| In Natural gas does not Granger cause ln India cases | 2.164063 |
| In India cases does not Granger cause ln Sensex | 0.0 |
| In Sensex does not Granger cause ln India cases | 0.248654 |
| In India cases does not Granger cause ln NIFTY50 | 0.261789 |
| In NIFTY50 does not Granger cause ln India cases. | 0.248654 |

Note: rejection of the null hypothesis and acceptance of causality at 5% level of significance

An examination of the above table makes it clear that India's Covid19 cases has no causal relations with the Gold Price. The rate of Gold or the Gold market neither influences nor is influenced by the Covid19 cases in India. We do not reject the null hypothesis

In case of Silver prices, it also doesn't have any causal relationship with Covid19 cases. Connotation that comes out of this relation is that when Covid19 cases increases (decreases), it doesn't have any impact on Silver rate or silver market.

Covid19 cases also does not causes change in cotton prices and the same way cotton rates does not causes covid19 cases, whether the cases in India increase or decrease it has no effect on cotton market.

The above table show clearly that Covid19 has no causal correlation with Crude oil prices and the crude oil prices also shows same. Crude oil does not cause Covid19 cases in India.

Covid19 cases and Natural gas price has no relation in between, both show no causality. Neither Covid19 cause Natural Gas nor natural gas causes Covid19.

The null hypothesis related to covid19 cases and SENSEX has confirmed that neither covid19 cases nor SENSEX cause each other, which denote that covid19 does not has an effect on SENSEX in India. In fact, the F in causality tests turns out to be 0.

From the analysis of the above table, it specifies that covid19 does not causes Nifty50. The implication shows there is no effect of covid19 cases on nifty50

The above test show that whether the covid19 cases increase or decrease in India it has no significant impact on either of the market-the stock market and the commodity market.

# CHAPTER-V

# CONCLUSION

The COVID-19 epidemic has had an impact on the world economy, in which India plays a significant role. Because India has the world's second-largest population, the pandemic poses a significant danger to the country. Whether it was a stock market or a commodity market, the COVID-19 had an impact on practically all markets throughout the world. The world came to a halt as a result of the viral epidemic, which ushered in the century's worst catastrophe. Even once a vaccination is available, strict lockdown and social distancing are the only options for stopping the virus from spreading.

This research aims at how COVID-19 has affected Indian stock and commodity markets. The report is based on daily data from the Indian stock markets and commodity derivatives market over the previous two years on stock and commodity prices, as well as the covid19 everyday cases from 30th January 2020 to 19th March 2021. The OLS Regression method, Augmented

Dickey Fuller (ADF) test and Granger causality tests were used to estimate the impact of Covid19 on the financial markets.

First chapter is the is the introduction of the research problem along with its objectives, scope of study and need to study. Chapter II is on the detailed literature review under the effect of covid19 on Indian financial markets and to some other countries financial market. In chapter III is based on the date base and methodology, where it provides the date source, description of chosen variable and the method which is adopted to find the favorable outcomes Also tried to show phases of lockdown in the country. Chapter IV, an effort has been made to understand the effects of Covid19 on stock market and commodity market through time-series data econometrics modelling and using the graph showing the trends of all the chosen variable over the years.

Table 1 analyzed the descriptive statistics- mean, skewness, kurtosis, standard deviation, minimum and maximum of all the variables showed the significant variability in stock prices (Sensex), moderate-high variability in all the commodity market except Natural Gas which showed less moderate.

The result of Table 2 that analyzed Coefficient of Variation which showed natural gas shows greatest variability amongst while the least variability is shown in silver.

Table 3 that analyzed Regression by using the OLS method where it showed R-square and Adjusted R-square is 0.74 which means 74% variation in covid19 cases over the stock market and commodity market. Estimating the Hypothesis showed we accept null hypothesis (H0) that means that there is no significant relationship between India Covid19 cases and gold rate, cotton rate, crude oil rate, natural gas rate and Sensex, whereas the finding shows that there is a

significant relationship between silver prices and nifty50 prices, which mean the price of the silver and nifty50 has an impact of the novel coronavirus.

Table 4 shows the Augmented Dickey Fuller (ADF) test, which is done to find the stationarity of the variable at a significant level. All the variables were found stationary at the level of significance of 5%.

The result of Table 5 analyzed Granger causality test. Causality analysis pointed towards different story for silver price and nifty50 price whose results shows there is no casualty between the Covid19 cases and silver and nifty50 prices. In the point of the fact the Causality analysis showed no casualty between the Covid19 cases and any of the variables in stock market and commodity market. The estimation showed there is no impact or any kind of relationship between the Covi19 cases and the changes on the prices of financial market.

The study clearly indicates that the outbreak pandemic novel corona virus is not affecting the stock market index and the commodity market index hence certainly some exogenous factors are there which affects it and needs to be found and scrutinized to study this whole impact chain completely. Paul Krugman (2020) in New York Times column, said out loud what many people were thinking: *"Whenever you consider the economic implications of stock prices, you want to remember three rules. First, the stock market is not the economy. Second, the stock market is not the economy. Third, the stock market is not the economy (…). The relationship between stock performance – largely driven by the oscillation between greed and fear – and real economic growth has always been somewhere between loose and non-existent".*

## 5.1 Limitations

The limitations of this study are also countless, first of all is that the study takes the secondary data which was readily available from various sources. So, there might be a case where our data is unreliable. Secondly, tests such as ADF and Granger causality analysis were used to draw the findings and the results so, various other tools could be used to do the same study. Thirdly corresponding time period as regards two years data which could be constraint for analyzing the research work. This study has also neglected the influence on stock market fundamentals of macroeconomic factors.

## 5.2 Scope for Future Research

Since the pandemic is expected to be a long-lasting phenomenon there is need for deeper investigation into how this will affect the stock market as well as the real variables in the economy. The pandemic is also being considered to be a precursor to extreme events associated with climate change.

.

# REFERENCES


Ahmed, F.; Syed, A.A.; Kamal, M.A.; de las Nieves López-García, M.; Ramos-Requena, J.P.; Gupta, S. Assessing the Impact of COVID-19 Pandemic on the Stock and Commodity Markets Performance and Sustainability: A Comparative Analysis of South Asian Countries. Sustainability 2021, 13, 5669. https://doi.org/10.3390/su13105669

Alam, Mohammad Noor And Chavali, Kavita(2020)- Stock Market Response during COVID-19 Lockdown Period in India: An Event Study. -*The Journal of Asian Finance, Economics and Business* | *Korea Science* https://doi.org/10.13106/jafeb.2020.vol7.no7.131

Bal. D & Mohanty, S. (2021). Sectoral Nonlinear Causality Between Stock Market Volatility and the COVID-19 Pandemic: Evidence from India. *Asian Economics Letters, 2(1)*

Bora. D, Basistha. D (2021) The outbreak of COVID-19 pandemic and its impact on stock market volatility: Evidence from a worst-affected economy. https://doi.org/10.1002/pa.2623

Chakrabarty R, Sarkar A. Efficiency of The Indian Commodity and Stock Market with Focus on Some Agricultural Product. Paradigm. 2010;14(1):85-96. doi:10.1177/0971890720100110

Chaudhary. R, Bakhshi. P and Gupta. H (2020). The performance of the Indian stock market during COVID-19. *Investment Management and Financial Innovations, 17(3), 133-147. doi:10.21511/imfi.17(3).2020.11*

Chen, N., Roll, R., & Ross, S. (1986). Economic Forces and the Stock Market. *The Journal of Business, 59(3), 383-403*. Retrieved July 16, 2021, from http://www.jstor.org/stable/2352710

Dr. Bhagwat and Marabi A. S (2016)-A Study of Commodity Market V/S Multi Commodity Exchange of India Limited (MCX*). International Journal of Research in Management, Economics and Commerce ISSN 2250-057X, Impact Factor: 6.384, Volume 6* Issue 04, April 2016

Dr. Khanna. K (2019)- Crude Oil Prices Deluge and Indian Stock Market: Precariousness Effect.

Dr. Pushpalatha. S, Dr. Sekhar. B. M. R (2020)- Commodity Futures Market Performance in India With Reference to Crude Oil and Natural Gas. *ISSN: 2249-6661 Vol-43, No.-03 (IX)* July-September (2020)

Dr. Yadav. A (2020)- Covid19 Impact on Twelve Sectors of The Indian Economy. *European Journal of Molecular & Clinical Medicine ISSN 2515-8260 Volume 07,* Issue 08, 2020

Farid. S, Kayani. G. M, Muhammad Naeem. A, Shahzad. J. H (2021)- Intraday volatility transmission among precious metals, energy and stocks during the COVID-19 pandemic. *Article in Resources Policy · April 2021 DOI: 10.1016/j.resourpol.2021.102101*

Jhunjhunwala. S, Suresh. S (2020)- Commodity and Stock Market Interlinkages: Opportunities and Challenges for Investors in Indian Market.

K Khanna, N Sharma (2012)-Crude Oil Price Velocity & Stock Market Ripple' - A Comparative Study of BSE with NYSE & LSE. - *SSRN 2122258,* 2012 - papers.ssrn.com

Kaur. G and Dhiman. B (2017)- Dynamic Linkage Between Indian Stock Market and Commodity Market. *Article in International Journal of Applied Business and Economic Research* · January 2017

Krugman, P (2020), "Crashing Economy, Rising Stocks: What's Going On?", *New York Times*, 30 April.

Lamaa. A, Jhab. G. K, Paula. R.K and Gurunga. B (2015)- Modelling and Forecasting of Price Volatility: An Application of GARCH and EGARCH Models. *Agricultural Economics Research Review Vol. 28 (No.1)* January-June 2015 pp 73-82 DOI: 10.5958/0974-0279.2015.00005.1

M Mazur, M Dang, M Vega (2021)-COVID-19 and the march 2020 stock market crash. Evidence from S&P1500.

Maggiori. G. M, Stroebel. J & Utkus. S (2021)- Inside the Mind of a Stock Market Cras- *NBER Working Paper No. 27272* May *2020 JEL No. G0,G00,G11,G12,R20*

Maitra. D, Dewar.V (2018)-Return and Volatility Spillover among Commodity Futures, Stock Market and Exchange Rate: Evidence from India. *Global Business ReviewVolume 20*, Issue 1, February 2019, Pages 214-237, *2019 International Management Institute, New Delhi.* https://doi.org/10.1177/0972150918803801

Meher. B. K, Hawaldar. I.T, Mohapatra. L, Adel M. Sarea (2020)-The Impact of COVID-19 on Price Volatility of Crude Oil and Natural Gas Listed on Multi Commodity Exchange of India. *International Journal of Energy Economics and Policy ISSN: 2146-4553*

Mukherjee. P and Bardhan. S (2020)- Assessing the Impact of COVID-19 on Interactions among Stock, Gold and Oil Prices in India. *Trade and Development Review Vol. 13*, Issue 1, 2020, 33 - 56. http://www.tdrju.net

Okoriea. D. I, Linb. B (2021)- Adaptive market hypothesis: The story of the stock markets and COVID-19 pandemic. *The North American Journal of Economics and Finance, Volume 57*, July 2021, 101397

Prabheesh, K. P., Padhan, R., & Garg, B. (2020). COVID-19 and the Oil Price – Stock Market Nexus: Evidence from Net Oil-Importing Countries. *Energy RESEARCH LETTERS*, 1(2). https://doi.org/10.46557/001c.13745

Prof. Patil. A, Dr. Sawant. V. K (2014)-Impact of Crude Oil Price Volatility on Stocks of Oil Companies and other Industries. - *ISSN – 22494359*, Vol No: 4,1-20, 1 June 2014

S Palakkod - The Romanian Economic Journal, 2012-Integration of capital, commodity and currency markets: a study on volatility spillover. *The Romanian Economic Journal*

Sensoy. A (2013)- Dynamic relationship between precious metals. Resources Policy Volume 38, Issue 4, December 2013, Pages 504-51

World Health Organization, 2020. Coronavirus Disease 2019 (COVID-19) Situation Report – 101. Geneva: World Health Organization.

Yamini (2020-) The Impact of Covid-19 On the Stock Returns of Companies of Oil & Gas Industry of G7 Nations. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3747524

See a real time indicator of COVID-19 at https://www.worldometers.info/coronavirus/.