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## A research study on the rise of crude oil prices with global context

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### ABSTRACT

*The price of Crude oil reached a 32 month high as the price of Brent crude rose by 6 tenths of a percentage to \$73.29. However the surge is not expected to end here. The rise in the price of crude oil has led to the surge in the price of petrol and diesel which is already becoming unaffordable for the common man. The rise in price of crude oil can be explained by Adam Smith also known as the father of economics, theory of supply and demand. In the year 2020 the world was plagued with an unforeseen once in a century pandemic. During the time of the pandemic many countries were forced to put its people on Lockdown which led to a drastic fall in demand which led to crude oil being traded on the negative thus at that time a decision was taken by the Organization of Petroleum Exporting Countries (OPEC) to cut the supply. In the year 2021 with the discovery of the Vaccine against the coronavirus Economic activity has resumed in most parts of the world which led to a sky rocketing of demand with which the supply, previously cut could not match. The current price of Brent crude is now at \$52 a barrel at the time of Lockdown it was trading at 19 dollars a barrel. According to OPEC's monthly report of June they expect the demand of crude oil 96.58 barrels per day when in 2020 it was 90.63 barrels per day. According to the same report the demand of crude oil is said to further increase in the second half of the year with more and more of the world resuming economic activity. The international energy agency has predicted that by 2022 the pre pandemic level demand will be surpassed and has asked all oil producing nations to "open the tap" to continue to keep the world running. The rapid increase in the price of crude oil has had a significant impact on the state of India. Petroleum prices have skyrocketed and have become almost unaffordable to the common man. The price of petrol has been raised by 10.8 rupees a litres and in the same time period the price of diesel has been raised by 11.5 rupees a litre with both fuels being sold upwards of rupees 100 a litre.*

**Keywords:** Crude Oil Price, Growth of Indian Economy, Inflation, Imports of Crude Oil, Balance of Trade Deficit, GDP

### 1. OVERVIEW

#### History

In the world we live in today oil is said to be one of the most valuable commodities. The roots of the modern Oil industry can be traced to Baku, Azerbaijan where in 1837 the first oil refinery was founded. This was succeeded by the discovery of the modern oil well in Azerbaijan in 1846 which had a depth of 21 meters. By that time, a single oil field in Baku accounted for over 90% of the world's oil production, mostly going to Persia (now Iran). The commercial oil well however did not stay limited to Azerbaijan with its discovery in Bobrka, Poland (1854), Bucharest, Romania (1857), Ontario, Canada (1858) and Pennsylvania, USA (1859). The state of Pennsylvania took the greatest advantage with producing over more than half the world's oil. World war 1 drove the price of oil to an all time high. With the increased popularity of cars and vehicles the price increased from \$3.07 a barrel, falling back to \$1.61 by 1922 as production increased. The war led to several states nationalizing of oil fields by various states like Iran, Indonesia and Saudi Arabia. Egypt took complete control over the Suez Canal where over 5% of the world's oil passed. Officials from the states of Kuwait, Iran, Iraq, Saudi Arabia and Venezuela met in Baghdad and agreed to form the Organization of Petroleum Exporting Countries (OPEC), with the aim of reducing competition between their nations and controlling prices. In 2003 the United States invasion of Iraq was succeeded by the uncertainty in the crude oil industry about its supply. The demand was mostly driven by the state of China contributing to a rise from \$28.38 in July 2000 to over \$146.02 in July 2008. From there, prices fell and rebounded as a result of the global financial crisis, reaching \$126.48 following the resistance movement of the Arab Spring in various middle eastern states against the authoritarian governments which created global supply shortages. According to the U.S Energy Information Administration the top 10 oil producing nations as of 2020 are

Country	Million barrels per day	Share of world total
United States	18.60	20%
Saudi Arabia	11.01	12%
Russia	10.50	11%
Canada	5.29	6%
China	4.93	5%
Iraq	4.16	4%
United Arab Emirates	3.79	4%
Brazil	3.78	4%
Iran	2.81	3%
Kuwait	2.66	3%
Total top 10	67.52	72%

### **Objectives**

The main objectives of this paper are:

- To identify the causes of price fluctuation in crude oil.
- To analyse the effectiveness of available means in regulating crude oil prices.
- To study the impact of crude oil prices in India.
- To examine the global effectiveness of crude oil prices in India.
- To study the impact of rise in crude oil prices on the trade deficit.

### **2. INTRODUCTION**

The price of Crude oil reached a 32 month high as the price of Brent crude rose by 6 tenths of a percentage to \$73.29. However the surge is not expected to end here. The rise in the price of crude oil has led to the surge in the price of petrol and diesel which is already becoming unaffordable for the common man. The rise in price of crude oil can be explained by Adam Smith also known as the father of economics, theory of supply and demand. In the year 2020 the world was plagued with an unforeseen once in a century pandemic. During the time of the pandemic many countries were forced to put its people on Lockdown which led to a drastic fall in demand which led to crude oil being traded on the negative thus at that time a decision was taken by the Organization of Petroleum Exporting Countries (OPEC) to cut the supply. In the year 2021 with the discovery of the Vaccine against the coronavirus Economic activity has resumed in most parts of the world which led to a sky rocketing of demand with which the supply, previously cut could not match. The current price of Brent crude is now at \$52 a barrel at the time of Lockdown it was trading at 19 dollars a barrel. According to OPEC's monthly report of June they expect the demand of crude oil 96.58 barrels per day when in 2020 it was 90.63 barrels per day. According to the same report the demand of crude oil is said to further increase in the second half of the year with more and more of the world resuming economic activity. The international energy agency has predicted that by 2022 the pre pandemic level demand will be surpassed and has asked all oil producing nations to "open the tap" to continue to keep the world running. The rapid increase in the price of crude oil has had a significant impact on the state of India. Petroleum prices have skyrocketed and have become almost unaffordable to the common man. The price of petrol has been raised by 10.8 rupees a litre and in the same time period the price of diesel has been raised by 11.5 rupees a litre with both fuels being sold upwards of rupees 100 a litre.

### **Importance**

Crude oil is one of the most important commodities in today's world. Crude oil is one of the most important sources of fuel. Crude oil contributes to over a third of the energy consumption and is a multi trillion dollar industry.

Crude oil has both industrial and domestic importance. Oil prices affect 95% of the world's transportation which impacts the price of food all over the world. It also impacts 45% of industrial products and around 20% of residential use. As a result, higher oil prices increase the cost of everything you buy, creating inflation.

As the cost of oil rises, carriers are forced to raise the prices or sustain losses thus the rise in crude oil prices not only affects the transportation company but also the business who ship their product and the profit source of the shipper as well. It is an outward facing domino effect: it costs more for the freight carrier to transport the freight, the shipper is going to be charged more to make up for this.

The most efficient mode of transport is becoming less and less economically sustainable for producers to move goods using fuel inefficient methods relative to the market the cost of rail usage is low and fuel costs are high, a logistics company may ship more freight via intermodal carriers than over the road trucks.

Ultimately what this means is that products are going to be sold to customers at a higher price to cover up the higher transportation and logistical costs due to the hike in the price of crude oil. Basically, higher fuel costs cause product inflation, and affect every aspect of production transportation along the way.

### **Scope**

Price fluctuation of Crude oil has been a major problem and thus a solution to that would be for countries to implement an oil price stabilization fund. In uncertain times like these where the price of crude oil has been at its all time high a price stabilization fund can be used to check extreme rises in prices while providing relief to both customers and oil companies. The fund can provide relief

in bad times to cover for revenue loss by cross subsidising from good times without hurting the common man. Under the model, the government may not need to support the fund through budgetary allocation but the fund could be self-sustaining. It could build surplus during falling oil prices by keeping retail product prices stable. This money can then be used in a rising market by keeping retail prices under check by compensating losses incurred by oil companies. Petrol and diesel prices in the country have already breached all-time high levels and with OPEC indicating continuation of crude production cuts, oil prices may rise further necessitating further increase in petrol and diesel prices. This could be checked if a price stabilisation fund is created.

There are various industrial and domestic uses of crude oil. One of the biggest domestic uses of crude oil is in kitchen appliances, many major kitchen appliances depend on petroleum. The molded interior panels, door liners and foam insulation are manufactured using crude oil. The stove functions using natural gas. The industrial use of food oil can be seen in the food industry. Crude oil plays an important role in the production of food apart from its transportation. Most of our food we eat requires fertilizer to grow. Fertilizer requires petroleum to be produced thus when the price of crude oil goes up the price of our food automatically goes up. Oil is undeniably one of the most important commodities in our world today. The price and production of oil affects the price and production of almost everything required in our daily lives whether industrial or domestic.

### **Criticisms of the Oil Industry**

The oil world has seen many shocks over the years, but none has hit the industry with quite the ferocity we are witnessing today. As markets, companies and entire economies reel from the effects of the global crisis caused by the coronavirus (COVID-19) pandemic, oil prices have crumbled. The impacts is felt throughout oil's global supply chains and ripple into other parts of the energy sector. The major criticisms or challenges of the crude oil industry is that the major oil producing countries are authoritarian states who do not follow much of International law. The OPEC+ is dominated and controlled by authoritarian states like Saudi Arabia and Russia. When the Indian government asked the OPEC+ to keep a pump more crude the power of these authoritarian states in the alliance did not allow that and decided to hold output at a current steady rate.

### **3. LITERATURE REVIEW**

Yuhang Zeng, Ziqing Du (2019) examined the important role of crude oil in economic activities, with both commodity attributes and financial characteristics. Through a comprehensive review of the literature they present the following phenomenon. First, the forecasts and risk management of crude oil prices are still important topics when researchers conduct studies, however, the uncertainty of economic activity has aggravated the fluctuation of crude oil prices. Second, factors from supply side and demand side are main drivers of movements of crude oil prices, and investor sentiment gradually becomes an important factor affecting the expected level of crude oil prices. Third, economic activities and financial stability are influenced by shocks of crude oil prices, meanwhile, many studies confirm the asymmetric effects. However they find, due to changes in the external environment, more complex nonlinear time-varying features are exhibited. In addition, the advent of text mining technology and artificial intelligence technology provides new and effective methods for forecasting the trend of crude oil prices and conducting risk measurement in the crude oil market.

Siok Kun Sek, Xue Qi Teo and Yen Nee Wong (2015) use an empirical analysis to study the effect of oil price changes on inflation in two groups of countries, namely the high versus low oil dependency groups. In addition, they also compare the relative effect of oil price with other types of shocks such as real exchange rate, domestic output and exporters' production cost. They model the pass-through equation in an autoregressive distributed lag (ARDL) format and the model is estimated using a pooled mean group method. Their results reveal that oil price change has its direct effect on domestic inflation in the low oil dependency group but its impact is indirect on affecting the domestic inflation in the high oil dependency group through changes on the exporter's production cost. The main determinants of domestic inflation are real exchange rate and exporter's production cost (high oil dependency group) and domestic output and exporter's production cost (low oil dependency group). They suggest the policymaker to stabilize the effects of these shocks through monetary policy accommodate.

Dr. K. Soundarapandiyam, Dr. M. Ganesh (2017) examined how To tame inflation & to sustain rapid economic growth crude plays a vital role in VUCA market where in the world, India is positioned 4th largest consumer of crude oil by importing 100 million tons of crude oil every year which falls 37 percent of the total import. Crude is a price determinant among various other commodities since rise or fall in price will directly have an impact on price of various commodities and society as a whole. Even reduction of one-dollar in price of crude impacts three-fold effect in the economy i.e., saves the country about 40 billion rupees. The downward range of fall in oil prices nearly 55 percent since June 2014 authenticates the reason of oversupply from OPEC & US and sluggish demand in usage across the globe. India has recently adopted a pricing mechanism for its petroleum products which reflects the global crude prices. India's reflection to the global trend on crude prices has an impact of 57 percent fall in price which India capitalized to fund its current account deficit which paved the way to stabilize the exchange rate. This paper addresses the impact of crude oil price on the Indian economy by considering the relevant inputs like Gross Domestic Product (GDP), Consumer Price Index (CPI) and Crude Oil Price for the period of 15 years (2001 – 2015). The proposed model to analyze the linkage among the key variables is done by using Regression model.

Ibrahim Tuhiran and et.al (2012) examined the dynamic relationship between oil prices and exchange rate of selected growing economies. It stated three points, first contrary to the general use of developed country, the researcher taken emerging markets to study the relationship between oil prices and exchange rates. The monetary models to explore the exchange rates, oil is in use as alternative advantage class and use daily oil price data to investigate the dynamics of exchange rate of an emerging market economies. The paper shows how this relation has changed by comparing the relationship before and after the financial crisis.

A. Hidayathulla, Mahammad Rafee. B (2014) examined the effects of oil price on exchange rate of Indian rupee against US dollar using time series data from 1972-73 to 2012-13. Multiple linear regression models are used to analyse the data. The model result

suggests that the import of crude oil continues to rise up when the crude oil future price increases. The oil imports thus became a extensive source of demand for dollar in India's foreign exchange market. This strong demand contributes to strengthen the price of dollar against Indian rupee, among the other factors. This finding will contribute to Indian government in making policy to control the petrol price to avoid rupee depreciation against US dollar.

Anshul S.Gurmeet, Manisha ,Pooja (2012) Analyzed the effects of crude oil price on Indian economy because India's imports of oil are growing. Our import dependence has reached 80 per cent and is likely to keep mounting. At the same time 2008 saw an extraordinary rise in oil price on the world market. Oil price instability has also amplified. Though future oil prices are difficult to envisage, they are generally probable to rise. The oil prices have started rising significantly since the initiation of the twenty first century. Theoretically, one can judge the impact of an oil price shock. The instantaneous outcome of the oil price shock is the augmented Cost of production due to improved fuel cost. Whenever there is an overall inflation in the economy, the cost of construction would also rise causing a decrease in supply. On the other hand, inflation implies a fall in the purchasing power of people. In short, oil price oscillation has adverse possessions on the economy

A. Aparna (2012) Discussed that positive change in the crude oil price has an immediate negative impact on the increment in the GDP and IIP whereas it affects the WPI positively. While GDP and IIP show signs of oscillating decay over a period of time, WPI, after a positive increment, returns to its original value within four months. A shock or impulse when given to WPI affects GDP in the same fashion considering the fact that WPI also includes other terms apart from fuel which constitute nearly 14.23% weight directly but also indirectly influences other commodity baskets. It also affects the IIP negatively and the effects last for a considerable period of time showing signs of oscillating decay.

#### **4. RESEARCH METHODOLOGY**

##### **Hypothesis**

The study put the following hypothesis to test:

Ho-Restricted supply of crude oil has resulted in price hike.

H1-There is no relevance of supply of crude oil prices with its prices.

##### **Data type and sources**

###### **Primary data**

The data which is unprocessed and collected for the first time by the researchers is termed as primary data. Definition of primary data It mainly refers to the one which is original and is originated for the first time by the one conducting research through his large efforts, mainly for finding out the solution to the research.

###### **Advantages of Primary Data**

- Data collected is very specific to the problem and is useful.
- Quality of the data collected is not doubtful and is meaningful.
- It may lead to the discovery of additional data and information during its collection.

###### **Disadvantages of Primary Data**

- There are numerous hassles involved in the collection of primary data like taking a decision such as how, when, what and why to collect.
- The cost involved in the collection of primary data is very high.

###### **Secondary data**

The data which is **second hand** and on which several statistical operations have been performed to get specific information is called secondary data. This data is specific in nature and saves time and effort. The secondary data is collected from various sources like publications, internal records of the company, censuses, books, journals, websites etc. This data is termed as a refined form of data and degree of accuracy and reliability is less in comparison to primary data.

###### **Advantages of Secondary Data**

- There is no issue of data collection as it is obtained by performing operations on primary data collected.
- The cost involved in secondary data collection is relatively less.
- Quality of data is not the responsibility of the investigator.

###### **Disadvantages of Secondary Data**

- It may not be possible that the information or data required for obtaining the secondary data is available.
- Getting detailed and clarified data on some topic is not possible in secondary data as a limited source of information is there.
- This data would be unrealistic or fake.

##### **Sampling Methodology**

When you conduct research about a group of people, it's rarely possible to collect data from every person in that group. Instead, you select a sample. The sample is the group of individuals who will actually participate in the research.

To draw valid conclusions from your results, you have to carefully decide how you will select a sample that is representative of the group as a whole. There are two types of sampling methods:

- Probability sampling involves random selection, allowing you to make statistical inferences about the whole group.
- Non-probability sampling involves non-random selection based on convenience or other criteria, allowing you to easily collect initial data.



### Population

A set of maximum males and females were selected, to which findings were generalized.

### Sample Size

The sample size was restricted to only 100, which consisted mainly of people from different sectors of Mumbai due to time constraints.

### Sampling Area

Due to the Covid 19 Pandemic, the area of research was restricted to the city of Mumbai located in the state of Maharashtra in India.

### Sampling Procedure

The sample type & procedure opted for this study is prepared by circulating questionnaires via WhatsApp within the Mumbai city. The data collected is mainly on the basis of their profession, gender, etc.

### Limitations of this study

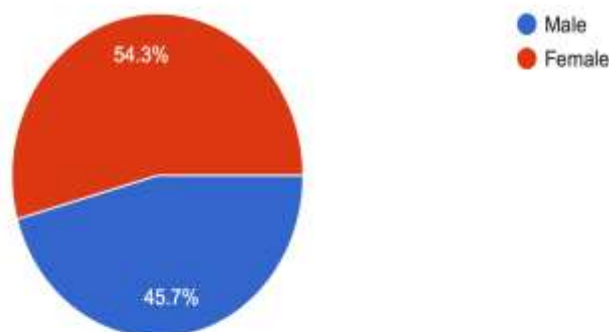
- The sample size obtained for primary data was of 46 people which may not bring out various different perspectives. In larger sample size could have generated more accurate results.
- The sample of people selected was limited to the people of Mumbai who could have a limited perspective.
- The people chosen in the sample could be unaware of the particular topic and thus the results of the survey could be inaccurate.
- Few of the secondary sources could have had a bias towards the policies of certain nations thus providing false information about the situation.
- Certain sources were published a considerable amount of time ago, the situation now is very different from what was happening in the past and thus certain information can be obsolete.

## 5. DATA ANALYSIS AND PRESENTATION

We took the survey: questionnaire method and results were as follows: we got 46 responses to the compulsory questions asked below:

### What is your gender?

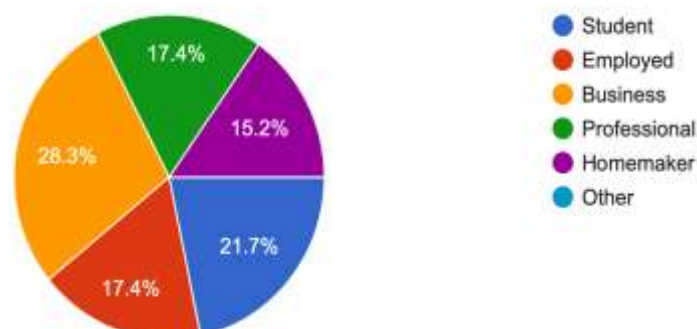
46 responses



- The respondents were equally divided between both genders.

### What is your profession?

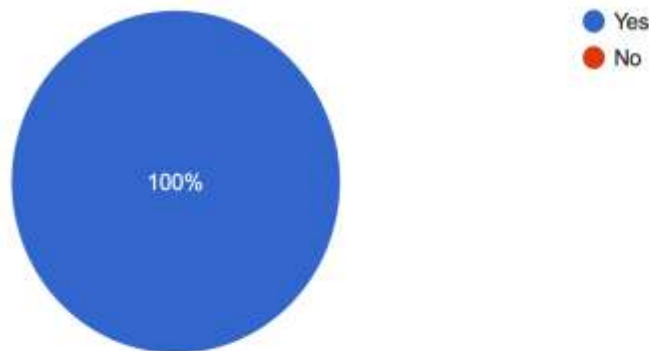
46 responses



- All the respondents were from different professions.

Do you use crude oil in any form in your daily life?

46 responses



- We can conclude that everyone of the 46 respondents use crude oil in their day to day life.

Recently do you know notice a change in crude oil prices?

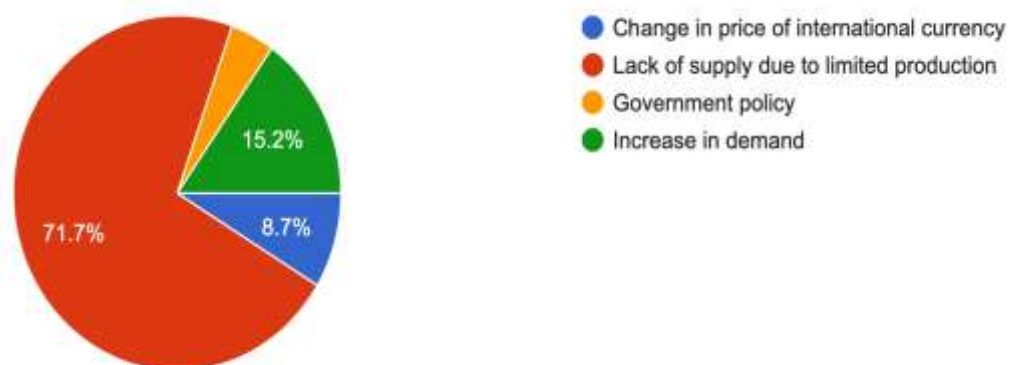
46 responses



- All the respondents noticed the sudden spur in the price of crude oil.

According to you what are the reasons of the recent change of crude oil prices?

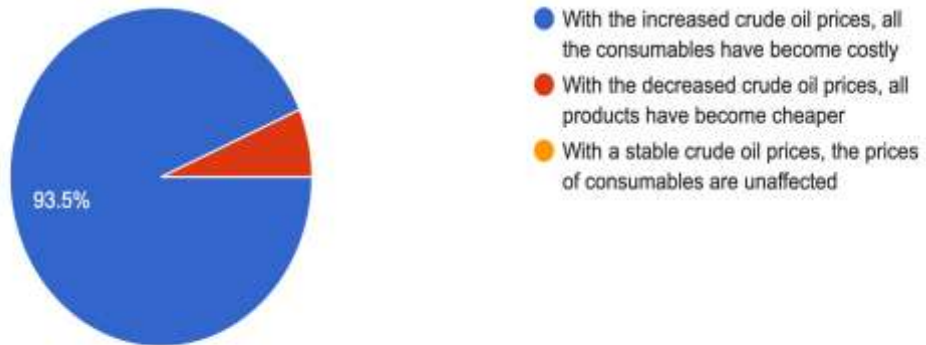
46 responses



- Majority of the respondents(71.7%) agreed that the rise in oil prices are due to the lack of supply due to limited production while the minority thought it was due to the increase in demand or the change in demand of international currency.

What are the consequences of recent change of crude oil prices?

46 responses



- All respondents concluded that consumables have become costlier due to the increase in crude oil prices.

Do you think the change of crude oil prices affects global economy?

46 responses



- The heat due to the rise of crude oil prices has affected the global

Do you think change of crude oil prices affects the Indian economy?

46 responses



- We can conclude that the change in crude oil prices has a direct effect on the Indian economy.

According to you Is there a significant relationship between change in GDP and the change in crude oil prices?

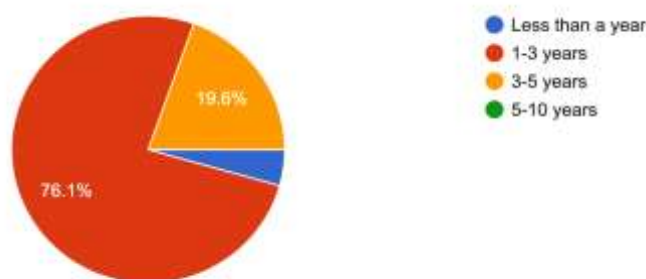
46 responses



- We can infer that there is a significant relationship between the change in GDP and the change in crude oil prices.

How long will this trend in crude oil prices seem to continue?

46 responses



- Majority of the respondents feel this trend of rising crude oil prices will continue for 1-3 years, the remaining minority feel that it will take 3-5 years for this trend to end.

## 6. CONCLUSION

This paper examined the effects of recent rise of oil price on Indian economy and on global economy using primary and secondary data. India's imports of oil are mounting. Our import dependence has reached 80 per cent and is likely to keep growing. In 2021, because of reduced production, it has shown a record rise in oil price globally from \$35.79 per barrel to \$75.25 per barrel. Oil price rate unpredictability has also amplified in India. Price has reached Rs 5675 per 100 BBL. Though future oil prices are difficult to predict, they are generally expected to rise. Given our increasing dependence on imports of crude oil has affected Indian economy adversely. By the increase in the price of crude oil the inflation has increased, Government have to spend too much on subsidy, our exports have become weaker, investment has decreased and GDP is also affected. Therefore my Null Hypothesis (H0) has been proved and my Alternative Hypothesis (H1) is proved wrong.

## 7. FACTORS AFFECTING CRUDE OIL PRICES GLOBALLY

1. **Production-** If the production or supply of crude oil in world market increases so the price generally fall. Production of crude oil from USA increases in 2014 that is the reason that there is a huge fall in price of crude instead of high demand. The price of crude oil touched to 83 \$/bbl in October 2014. Keeping pandemic of 2020 in mind, the producing nations have reduced production in 2021 leading to hike in crude oil prices globally.
2. **International Issues-** International issues like Russia Ukraine civil war, the attack on the Saudi Arabian Aramco oil facilities by the Yemenis Houthi rebels has affected the price of crude oil in international market.
3. **Cartel of OPEC member-** Cartel of OPEC member can also affect the price of crude oil in international market.
4. **Inventory-** Inventory cost of crude oil is very high any country cannot import more than a specific amount just because of inventory cost. So the inventory cost of crude oil also affect the price of crude oil.
5. **Demand-** According to law of demand if the demand of crude oil increases so the price also increases in global market. With an increase usage of motor vehicles and new models coming up, crude oil demand has and will always increase.

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## **APPENDIX**

### **Questionnaire**

Q1) What is your gender?

- Male
- Female

Q2) What is your profession?

- Student
- Employed
- Business
- Professional
- Homemaker
- Other

Q3) Do you use crude oil in any form in your daily life?

- Yes
- No

Q4) Recently have you noticed a change in crude oil prices?

- It has risen
- It has fallen
- It has remained stable

Q5) According to you what are the reasons of the recent change of crude oil prices?

- Change in price of international currency
- Lack of supply due to limited production
- Government policy
- Increase in demand

Q6) What are the consequences of recent change of crude oil prices?

- With the increased crude oil prices, all the consumables have become costly
- With the decreased crude oil prices, all products have become cheaper
- With a stable crude oil prices, the prices of consumables are unaffected

Q7) Do you think the change of crude oil prices affects the Indian economy?

- Yes
- No

Q8) Do you think the change of crude oil prices affects global economy?

- Yes
- No

Q9) According to you, Is there a significant relationship between change in GDP and the change in crude oil prices?

- Yes
- No

Q10) How long will this trend in crude oil prices seem to continue?

- Less than a year
- 1-3 years
- 3-5 years
- 5-10 years