FORECASTING THE IMPACT ON CRUDE OIL PRICES IN INDIA DURING RUSSIAN UKRAINE WAR

Anima Bag[1], Sarmistha Sarangi[2]
Rama Devi Women's University, Bhubaneswar, PIN-751022, Odisha, India.

The war between the two neighboring countries Russia and Ukraine is a major setback to the world economy and it adversely affect the growth and high Inflation rate, because of this crisis the whole world economy could be seen slower growth and faster inflation. Russia and Ukraine are the major commodities producers in general more particularly the oil. The war would definitely caused global prices soar

ABSTRACT : The war between the two neighboring countries, Russia and Ukraine adversely affects the world economy with slower growth and high inflation. Since the conflict between Russia and Ukraine started, firms have increased oil costs, which is biting consumers. As a result, the cost of vegetable oils, diesel, and petrol increases significantly. The purpose of this work is to fit the trend line based on the observation and make the future prediction. The scope of the study is to examine the trend line of the crude oil prices in different years. It is based on historical data taken from Annual Reports of the Crude Oil WTI futures.MS-Excel is used for analyzing the data and to plot it.

Key words: Inflation, Crisis, Trend, Crude oil, World economy

INTRODUCTION

India is the world's third-biggest purchaser of oil. It imports more than 80 percent of the oil needs each year out of which around 2 per cent is from Russia. India's total trade with Russia is around 1.3 per cent of its total trade worth rate USD 10 billion. India's imports from Ukraine in FY 2022 were USD 2.14 billion, and for 9 months of FY 2023 was USD 1.98 billion. The biggest affect on current accounts will be in the petroleum importers are ASEAN (Association of Southeast Asian Nations) economies India, frontier economies including some of the pacific island. Since the conflict between Russia and Ukraine started, firms have increased oil costs, which is biting consumers. As a result, the cost of vegetable oils, diesel, and petrol increases significantly. As the war broke out in February 2022, India's crude basket rose rapidly from $80 in 2022-23 to $110 in the six months. The global oil prices have been under high pressure due to the ongoing Russia Ukraine war.

India becomes optimistic in recovering stock market after the pandemic of COVID-19, by picking up production and manufacturing activates, recuperating market forces of demand and supply, interest rates and volatility getting under control, at least to an extent. But due to the Russia-Ukraine war that began on 24th February, 2022, new challenges are to be faced by India. It has been observed that most of the indices of the stock market have fallen by more than 10% since 1st February, 2022, with certain short breaks. Hence it is expected that the Brent crude oil prices will skyrocket to around $130 barrel within the next few months. More over due to the zero-covid policy of China and slackening world demand for oil, it becomes difficult to estimate the movement of the oil prices. Thus a substantial volatility and uncertainty in the market is created that effects Indian economy for policy making.

Moreover an indirect impact of war on Indian economy is also observed resulting domestic inflation and economic decay caused by market factors that includes depreciation of Rupees, rising the prices of metals and edible oil and rising the price of crude oil. Along with the immediate impact on health, education, manufacturing, service, tourism and other sectors, the war may have a short or medium run impact on price level, economic productivity, employment, wages, and demographic dividend. On the other hand, a window of unlikely opportunity for the Indian Agri-exporters is created during war as the whole world is looking at India to fill the vacuum created in stocks of wheat, maize, millet and other US and Europe`s breadbasket. India, still sold a record 1.4 million tonnes of wheat in April, and Turkey has placed an order for 50,000 tonnes of wheat for the first time, joining Egypt. To measure the impact of Russia-Ukraine war on Indian economy, it is important to conduct a robust evidence-based reactions, along with study of responsive policies.

DISCOUNTED OIL

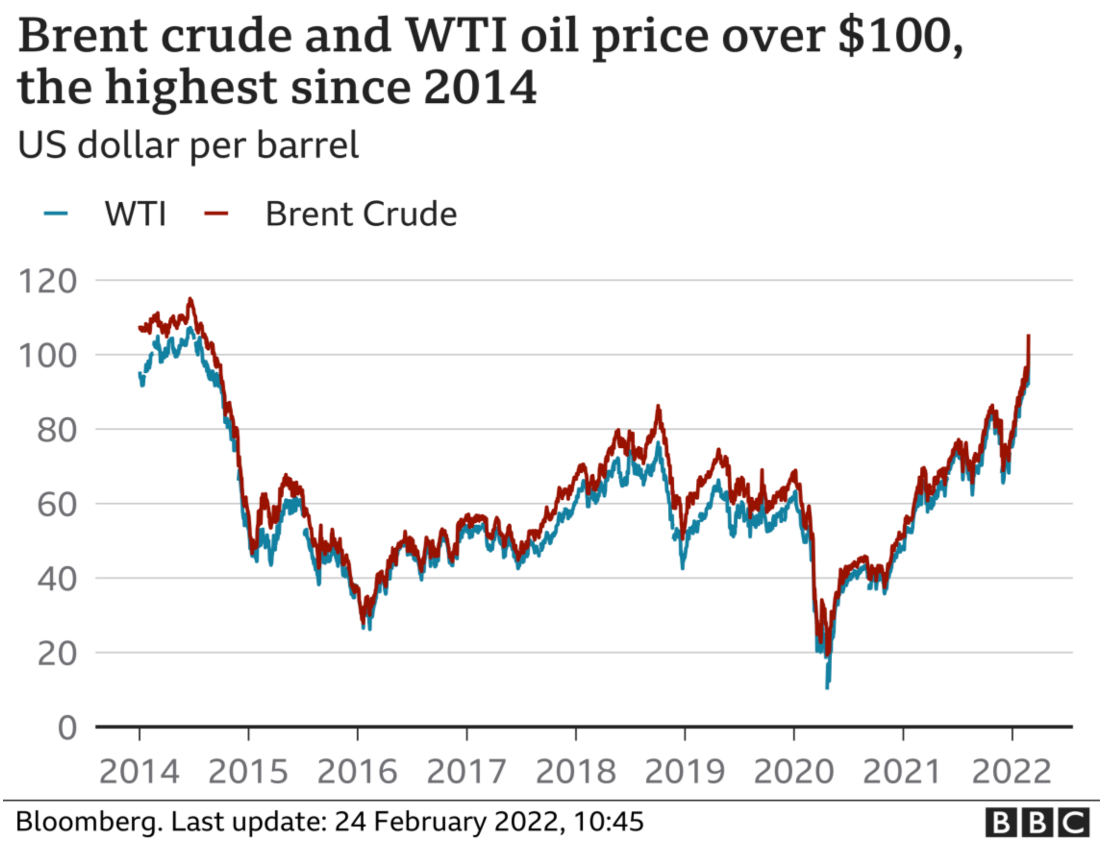
The main price-setting factor across all industries is oil. Even though fewer than 2% of India's oil imports in 2020–2021 came from Russia, the conflict has driven up prices globally. It's a big speed barrier for an economy ready to run that India imports more than 80% of what it need.

The $35 per barrel price reduction offered by Russia compared to pre-war pricing would go a long way toward reducing this year's anticipated inflation and currency problems.

Given that benchmark Brent crude was trading at $97 on February 23, the day before the invasion, Russia's guarantee would translate into a cost of $62, which is less than half of what it would be in Europe at the start of April. Due to the escalating geopolitical crisis in Ukraine, India's stock benchmarks saw their second worst day since March 2020, the month in which the nation introduced Covid restrictions.

Products that are directly tied to crude oil account for nearly 9% of the basket in the wholesale Price Index (WPI). Before products are sold at retail, their entire price is tracked by a wholesale pricing index (WPI). This includes the costs imposed by wholesalers and, frequently outside of the United States, manufacturers. The WPI is a measure of inflation that is frequently presented as a percentage change from a month or year ago.A research claims that a 10% increase in crude would result in an increase in WPI inflation of about 0.9%. Therefore, a rise in the price of crude oil will probably increase household spending in India.

For the first time since 2014, the price of a barrel of Brent crude oil surpassed the $100 level. The price of aviation turbine fuel (ATF) has increased 19% to Rs 90,519 per kl from Rs 76,062 per kl on January 1 as a result of the surge in crude oil prices. The rupee's value will be under pressure from rising oil prices. Currency will lose value, and inflation will increase.



Crude Oil Prices are Surging

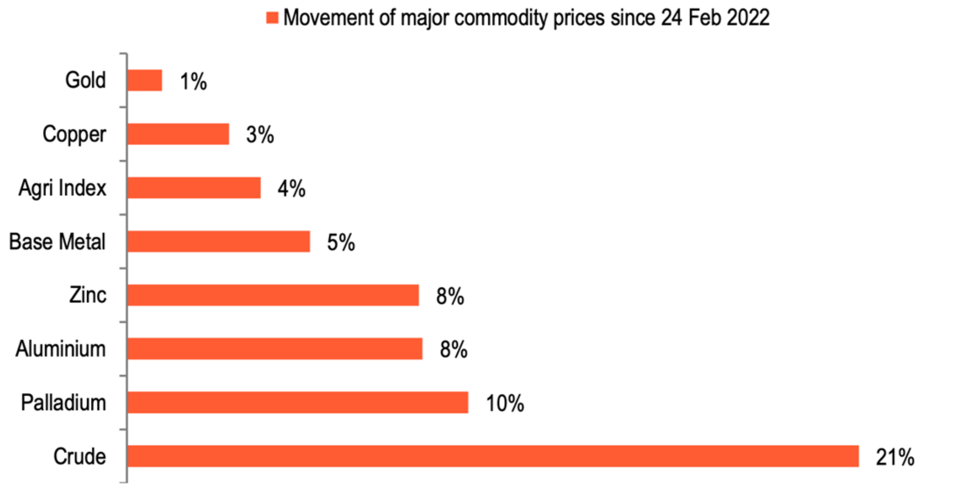
II. Impact of the war on India Economy

The main effects of the Russia-Ukraine war on the Indian economy include effects on Rupees, inflation, and economic growth, as well as repercussions on the price of oil and other commodities.

i) Impact on Oil Prices

Russia, the world's second-largest crude oil exporter after Saudi Arabia, meets a significant share of global oil demand, including that of India. In March, 2022, the global price of Brent crude oil reached $139 per barrel, but then fell to about $107 per barrel as a result of the Russia-Ukraine conflict. It has increased by about 20% overall, from about $89 per barrel since the beginning of the war. An inflationary, fiscal, and external sector crisis in the Indian economy may result from the rising oil costs. It causes negative effects of the pandemic on the manufacturing, tourism, transportation, and related economic sectors. On the other hand, the price of Russian oil also decreased from its pre-war level due to sanctions and a boycott of Russia by the US and numerous European economies. According to ICICI Securities, 3 mmbd less oil will be produced globally as a result of a projected 60% of the world's population banning commerce with Russia, maintaining the price of Brent crude over $100 per barrel for the majority of FY2022.India imports almost 85% of the oil it needs, and over 9% of the WPI basket is made up of goods directly related to crude oil. According to a report by Bank of Baroda Chief Economist Madan Sabnavis, a 10% increase in crude would roughly raise WPI inflation by around 0.9%, bringing the base projected WPI to roughly 11.5–12% for fy2022. The amount of oil imports in India's overall imports has increased to about 25.8%, and this percentage is predicted to rise further. On the other hand, every $1 per barrel increase in oil prices is also anticipated to raise petroleum costs by 60–70 pence per liter in retail fuel prices. Additionally, a 10% increase in oil prices is anticipated to aggravate India's trade deficit by $15 billion USD (or 0.4% of GDP). Escalating fuel costs are also anticipated to directly lower consumption, which was already impacted by the pandemic, bringing down the PFCE from 83.22 lakh crore in 2019–20 to Rs. 80–81 lakh crore in 2021–2022.

Fig 1. Impact of war on major commodity prices:

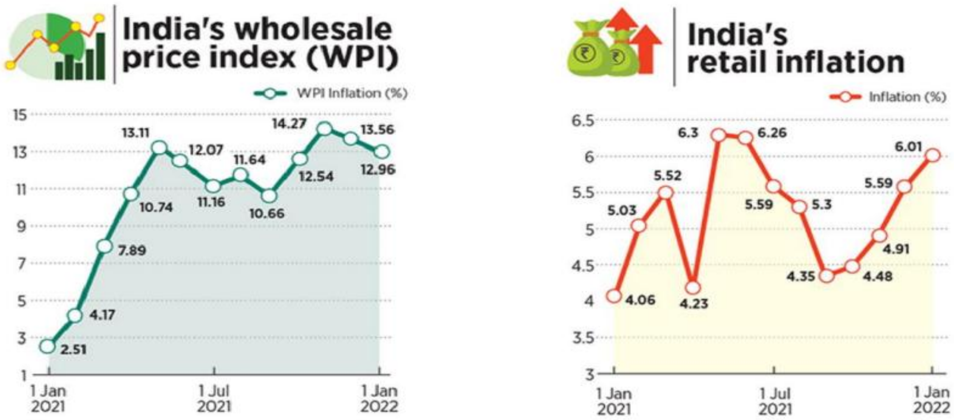


Source: Bloomberg, Bank of Baroda Research

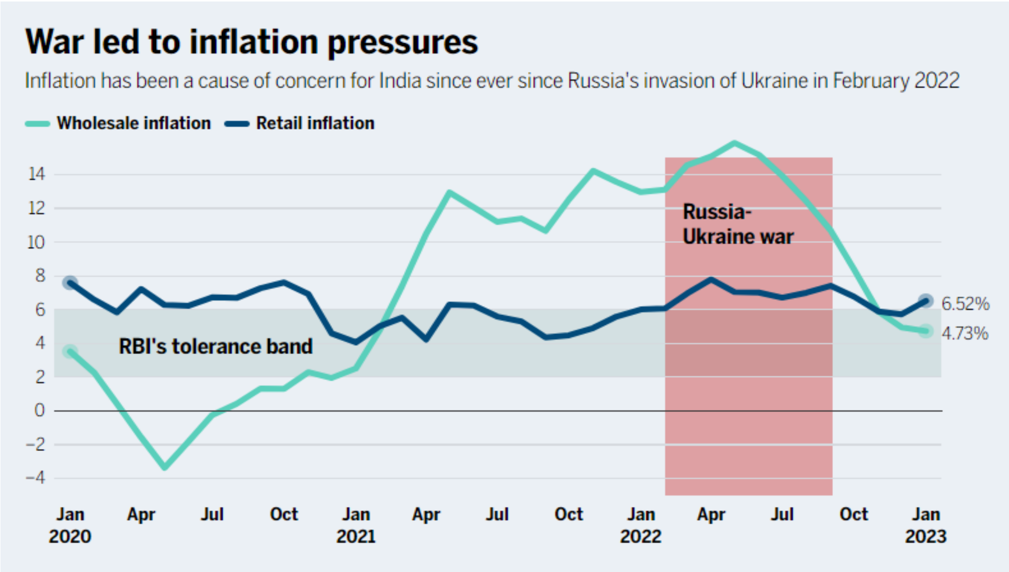
ii) Inflation and economic growth

The net effect of the COVID shock was on real GDP while the supply shock caused by the Russia-Ukraine war affects the Indian economy's supply. According to a Financial Express report, in January and the first few days of February 2022, the price of goods were raised by Indian manufacturers, as a result of the beginning of verbal attacks and expectation of war. The economy's oil industry is suffering as it observed an inflation increase of 30 basis points with a 10% increase in crude oil. The overall effect on inflation may become more complex due to the structural potential pass-through effects from high oil prices. As a result an increase in the price of the major consumer goods like edible oils, wheat and grains, fertilizers, crude oil, gas, and metals has also been observed on the global market.

Chart 2: Inflation indices in India



Source: Adapted by Author using data from MoSPI, trading Economics

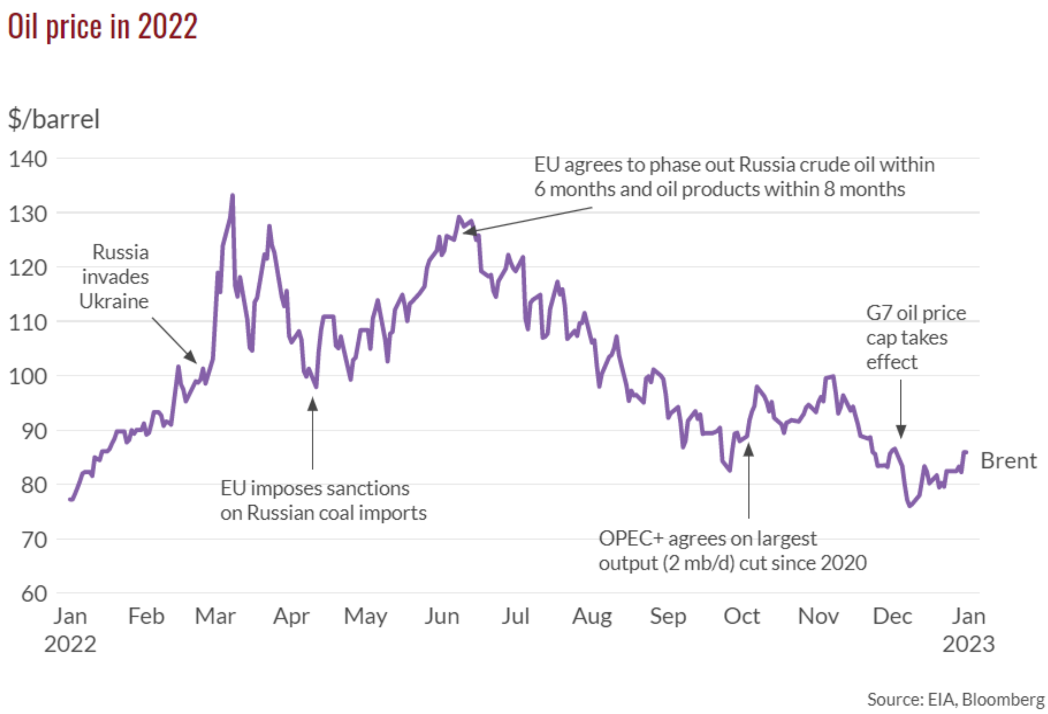


There is a spike on India's retail inflation to an 8-year high of 7.79% in April 2022, two months after Russia invaded Ukraine, and remained above the RBI tolerance level of 2-6%. This has happened due to the sharp increase in crude oil prices around the world, which exceeded $139 per barrel as a result of supply chain disruptions and many sanctions on Russia.

How it impacts the Consumer?

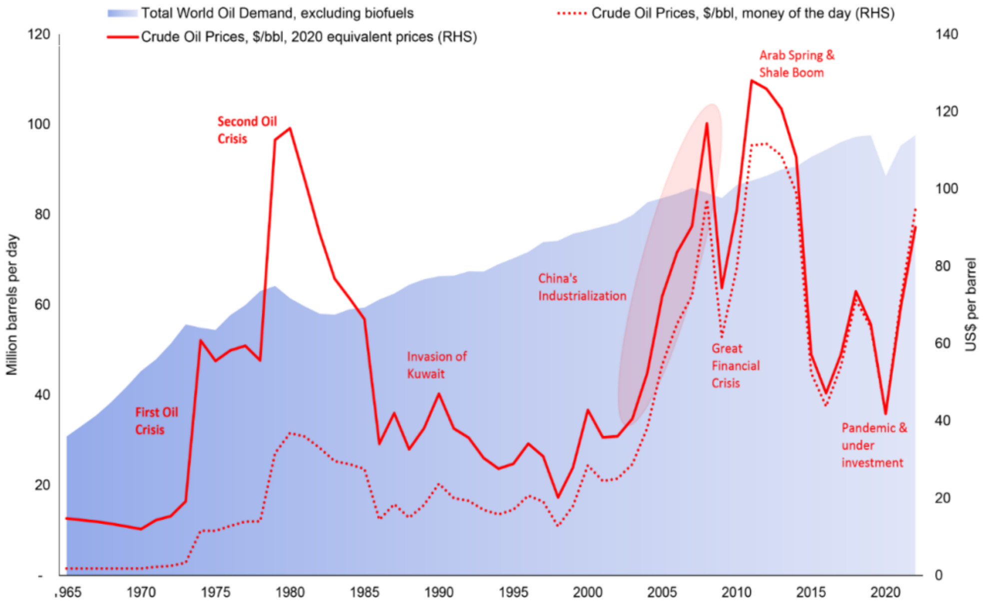
In 2021, prices for petrol and diesel increased and reached all-time highs across the nation as a result of high crude oil prices. As a result of the central government reducing the excise tax on petrol and diesel by Rs 5 and Rs 10 per liter, respectively, and most states following suit by lowering the value-added tax, gas prices declined in November. In the national capital, the going rate for petrol and diesel is currently Rs 95.3 and Rs 86.7 per liter, respectively. Now that crude oil prices are higher, customers may pay more for petrol. However, the local petrol prices, which are closely related to the price of crude oil globally, have not been changed for a record-breaking 110 days in a row. pricing is meant to be updated daily, but when the election season began in five states, state-owned fuel retailers frozen pricing.

GRAPHICAL REPRESENTATION OF OIL PRICESDURING THE YEAR 2022 (RUSSIAN UKRAINE WAR)



HISTORICAL CRUDE OIL PRICES REPRESENTED GRAPHICALLY

Chart 1:Historical Crude oil Prices

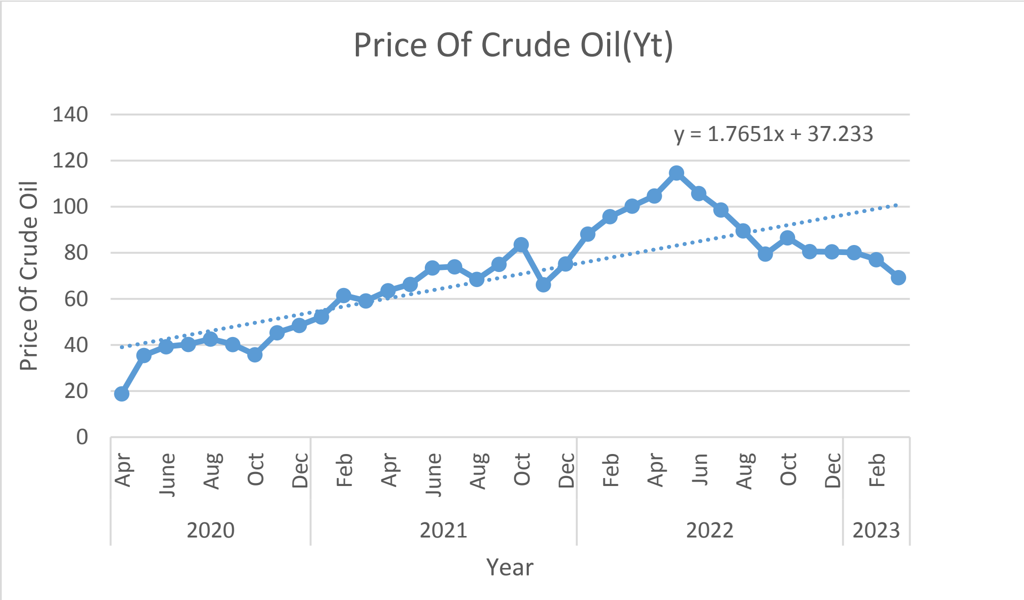


Source: Rystad Energy Research and Analysis, OMCube, March 2022

Crude Oil WTI Futures Historical Data

Data Range –Apr 2020 to Mar 2023

Year	Month (X_t)		Price Of Crude Oil (Y_t)	X_t^2	Y_tX_t
2020	Apr	1	18.84	1	18.84
	May	2	35.49	4	70.98
	June	3	39.27	9	117.81
	July	4	40.27	16	161.08
	Aug	5	42.61	25	213.05
	Sep	6	40.22	36	241.32
	Oct	7	35.79	49	250.53
	Nov	8	45.34	64	362.72
	Dec	9	48.52	81	436.68
2021	Jan	10	52.2	100	522
	Feb	11	61.5	121	676.5
	Mar	12	59.16	144	709.92
	Apr	13	63.58	169	826.54
	May	14	66.32	196	928.48
	June	15	73.47	225	1102.05
	July	16	73.95	256	1183.2
	Aug	17	68.5	289	1164.5
	Sep	18	75.03	324	1350.54
	Oct	19	83.57	361	1587.83
	Nov	20	66.18	400	1323.6
	Dec	21	75.21	441	1579.41
2022	Jan	22	88.15	484	1939.3
	Feb	23	95.72	529	2201.56
	Mar	24	100.28	576	2406.72
	Apr	25	104.69	625	2617.25
	May	26	114.67	676	2981.42
	Jun	27	105.76	729	2855.52
	Jul	28	98.62	784	2761.36
	Aug	29	89.55	841	2596.95
	Sep	30	79.49	900	2384.7
	Oct	31	86.53	961	2682.43
	Nov	32	80.56	1024	2577.92
	Dec	33	80.47	1089	2655.51
2023	Jan	34	80.11	1156	2723.74
	Feb	35	77.05	1225	2696.75
	Mar	36	69.26	1296	2493.36
SUM		666	2515.93	16206	53402.07



A particular method of examining a set of data points gathered over a period of time is called a "time series analysis." It can also be described as a collection of observations of a variable that were made at various times or intervals. Mathematically, it is defined as

$$Y_t = f(t), \quad t = t_1, t_2, t_3 \ldots\ldots\ldots\ldots$$

where Y_t is the value of the phenomenon at time t.

In the present research the time series is found to be increasing by an equal absolute amount and the straight line trend is obtained. By using the principle of least square the values of *a* and *b* for the straight-line trend $Y = a + bX$ are obtained.

The two normal equations required for finding the values of *'a'* and *'b'* are:

$$\sum y_t = na + b\sum x_t$$

and

$$\sum x_t y_t = a\sum x_t + b\sum x_t^2 \;;$$

we take $n = 36$

So $b = 36*53402.07 - (666*2515.93)/36*16206-(666)^2 = 1.765;$

$a = 69.886 - 1.765*18.5 = 37.236$

$\boldsymbol{y_t = 1.765x_t + 37.236}$

Hence by using the method of least square, a straight-line trend is obtained which can be used for future prediction of oil prices.

CONCLUSION

The purpose of the research work is to analyze the crude oil prices and its impact on Indian Economy during Russian Ukraine War. By plotting the crude oil prices during the year 2020-2023, we obtained the graph which shows an increasing trend. The trend line is a straight line which is obtained by using the method of least square. The research work achieved its objectives to predict the future values by using the trend line. Increase in oil price are generally thought to increase inflation and reduce economic growth. India, a nation that relies heavily on imports, is forced to buy raw resources at higher costs because of the stronger currency. So, the government should use monetary and fiscal measures to control inflation for a better economy.

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