



Inflationary Impression of Oil Price Shocks in Indian Economic System: A Macroeconomic Study

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ABSTRACT:

The paper examines the impact of crude oil price shocks on the Indian economy development. The present Indian economy growth has been facing the identical issues of escalating the trade disparity and continuing inflation. In this connection, the study focused on the determine relationship between the speculation and crude oil price impact on the Indian economic development activity and GDP growth. Crude oil prices have been rising steadily on the back of supply cuts by the Organisation of the Petroleum Exporting Countries (OPEC) for nearly a year now. Inflation is not being driven by surging demand; it is being stoked by a mix of high oil prices, high fuel taxes and elevated raw material costs. Crude oil prices hit a two-year high last month after Brent crude rose above the \$71 per barrel mark. Currently, it's above \$74 per barrel. This sharp rise in oil prices is impacting almost every business sector in the oil-importing countries, including India. Concerned over the ripple effect of this rise in prices, the Indian government has been taking up the issue bilaterally with the oil-producing countries and OPEC. While OPEC and other oil-producing countries have now agreed to increase the output by 0.4 million barrels per day between August 21 and December 21, the current oil prices are slowing down the pace of economic recovery in India after the devastating second wave of the pandemic.

Key Words: Crude Oil, Inflation, GDP, OPEC, Stock market, Exchange Rate, India

1 | INTRODUCTION:

Oil prices play a very considerable role in nation economy development and GDP growth, the present growth layer hovers everywhere the import of oil as India imports more than 70% of its crude oil necessities. In this research study, an effort has been made to examine Understanding the nature and dynamics of price fluctuations has dominated the macroeconomic research both on theoretical and empirical front over the years. It is widely believed that growth rate of money determines the rate of inflation in long run. As described in the famous Quantity theory of money, there exists a proportional relationship between inflation and the growth rate of money. However, the short run dynamics of inflation is more complicated in nature. Conventional models of price adjustments have stressed the role of inflation expectation, the degree of economic sluggishness in goods and labour markets and changes in relative prices as the main determinants of inflation in the short run. In fact, it is commonly believed that changes in supply side factors generally called supply shocks cause transitory deviation of inflation from its underlying trend by changing certain relative prices. For example, a negative supply shock in crude oil results in temporary upward pressure in headline inflation by raising the relative prices of food articles. Similarly, positive supply shock in crude oil reduces the headline inflation. However in classical framework, where price are assumed to be perfectly flexible, such relative price shocks should not lead to inflation (Friedman, 1975). In such a framework, in response to a relative shock, some firms increase their nominal prices while others decrease such that the price increase cancel out the price decrease, thereby leaving the aggregate price level unchanged. In contrast to Friedman's view, Ball and Mankiw (1992) argue that the large desired adjustments in energy sectors triggered quicker upward adjustments in nominal prices of such sectors. Nonetheless, the fall in the equilibrium prices in other sectors were too little to warrant downward price adjustments as it involves costs. Thus, some nominal price rise and others do not fall and as a result the general price level rises. Although, there is a consensus on the long run determinants of average inflation, yet the short run fluctuations in the inflation are not much clear. In general, short run fluctuation in aggregate inflation is mainly attributed to changes in relative prices of certain commodities, such as food and energy, driven by supply shocks (Gorden 1997). However, Ball and Mankiw (1992) argued that basically the explanatory power of food and energy prices originates from the fact that these commodities are important determinants of the shape of the overall distribution of price changes. In this context, the study aims at fully understanding whether inflation can be explained by the changes in crude oil prices over a period of time. There are voluminous empirical evidences available in the literature in favour of positive relation between oil price hike and inflation. But the role of crude oil prices as a major macroeconomic variable in determining inflation or in setting an inflationary trend has a short history. The twentieth century observed almost all the nations, powerful as well as the dependent, inclining more heavily on the availability and cost of crude oil prices in determining their economic prosperity as well as national wellness. Crude oil has indeed evolved over time as the life blood of all economies. In this backdrop, this study examines the relationship between aggregate inflation and crude oil prices. The relevance of this research to policy formulation particularly in an oil-dependent economy like India is to deepen the understanding of the transmission of pass-through of oil price to inflation in order to help monetary authorities anticipate the

effects of such fluctuations on inflation. What we observe in Indian economy is a continuous upward trend in crude oil prices which has its impact on common man's standard of living with a greater proportion of money burden on the low income class. The disproportionate impact of oil price shocks on richer as well as poorer sections of the society aggravates over time with respect to the intensity and frequency of price adjustments. In this context, bringing out the inflationary effect of oil-price shocks in the Indian economy is the major objective of the study. Also, I would be discussing on the transmission mechanism of inflation into the real economy. The theoretical framework would aid in understanding the inflation dynamics.

2 | REVIEW OF LITERATURE:

The path breaking paper 'oil and macro economy since World War-II' (Hamilton, 1983) has established that, fluctuations in oil price have generally negative impact on the economy, and this is one of the major factors for every post World War II US recession except the one in 1960. Later Hamilton's empirical results have been tested and confirmed by several subsequent studies. Gisser and Goodwin (1986) suggest that oil price had not lost its ability to predict gross national product (GNP) growth. Mork (1989) had examined Hamilton's results by extending the study with more data. Instead of using the producer price index (PPI), the real price of oil was taken. Mork used the refiner acquisition cost (RAC) for crude oil since 1974. The study examined Hamilton's result of a negative correlation between output growth and oil price hikes. His results showed that the correlation was even stronger than expected. The empirical results produced by Hooker (1996) confirm Hamilton's findings and his findings also suggest that the oil price level and its changes have influence on gross domestic product (GDP) growth. This is shown by a 10% spike in oil prices that led to almost 0.6% deceleration in GDP growth during the third and fourth quarters after the shock. Since the rapid fall of oil price in 1986, the established model has been challenged. There was little evidence to suggest that oil price decreases improve economic activity, in the same way that oil price increases suppress economic activity. Several authors therefore re-examined the oil price macroeconomic relationship, using instead asymmetric or nonlinear methods (i.e., Mork, 1989; Mork & Olsen, 1994; Lee et al., 1995; Hamilton, 1996; Hamilton, 2003; and Cunado and Perez de Gracia, 2003). They found that the negative linkage between oil price increases and economic activity still held. Consequently, it may be reasonable to partition oil price changes into oil price increases and decreases for the analysis of the related issue. Although a considerable amount of research has found that oil price shocks have affected the real output, only a few emphasise the effects of inflation. Blanchard and Galí (2007) examined the effects of the recent oil shock on output and inflation and attempted to answer why the current shocks (as in the 2000s) have had smaller effects on output and inflation than that in the 1970s. J de Gregorio, (1991) provided a variety of estimates of the degree of transmission from oil prices to inflation over time for a large set of countries. Moreover, using a structural cointegrated VAR model for G-7 countries, Cologni and Manera (2008) found that for all countries except Japan and UK, changes in oil prices did influence the inflation rates. With respect to the role of oil price changes in the economy, more and more studies show that there is a nonlinear relationship between oil prices and economic variables. Nearly all of the empirical analyses after Mork's (1989) study have found asymmetric economic responses to oil price changes. The asymmetry question has influenced much of the research such as Mork and Olsen (1994); Hamilton (1996), Cuñado and Pérez de Gracia (2005), and so on. They find that no significant relationship exists between oil-economy by using only oil price change as variable. Thus, all studies after 1990 began to include a separate negative and positive oil price changes variables as an alternative specification. There is the classical supply side channel according to which oil price increase leads to a reduction in output since the price increases signal the reduced availability of basic input to production. As a result, growth rate and productivity decline. Oil price shocks can increase the marginal cost of production in many industries reducing the production. After an oil shock, since the investment determines the potential output capacity in the long run, higher input prices reduce the investments, thus, output decreases and unemployment increases (Brown & Yücel, 2002). Using Vector Autoregressions, Zoli (2009) and Caceres et al. (2012) study the impact of commodity price shocks on inflation in Emerging Europe and Central Africa, respectively. Whereas relative prices to EU-15 countries are an important factor in explaining the response of inflation to commodity price shocks in Emerging Europe (see also IMF, 2015), price controls play an important role in Central Africa. These findings imply that the responses of domestic inflation to global oil price shocks in developing economies can be influenced by region-specific factors. Recently, Gelos and Ustyugova (2017) estimate country-by-country augmented Phillips curves using data from both advanced and developing economies for the period between 2000 and 2010. Different from other studies, their analysis suggests that high fuel intensities and preexisting inflation levels are the only significant factors explaining cross-country differences in the effects of food and oil price shocks. The conduct of monetary policy, including the existence of inflation targeting regimes, does not seem to be a major determinant of the degree of passthrough. Another strand of the related literature studies time-varying effects of oil price shocks on the economy, including inflation dynamics. This literature has emphasized that the underlying sources of oil price changes are critical determinants of their macroeconomic effects. For example, Kilian (2009), Peersman and Van Robays (2012), and Baumeister and Peersman (2013) show that the effect of oil price increases has different effects on real GDP and inflation whether they are driven by negative supply shocks or positive demand shocks. According to their decomposition, the oil price shocks of the 1970s are mainly attributed to exogenous shortfalls in oil production (negative supply shocks), while the prolonged build-up in oil prices that started in 1999 is mainly driven by shifts in the demand for crude oil (positive demand shocks). Similarly to the approaches used to study the cause of the Great Moderation (e.g., Galí, and Gambetti, 2009), we can test whether changes in the relative size of structural shocks over time simply drove the declined response of overall inflation to oil price.

3 | Objective of The Study:

The study examines the nature of relationship between crude oil price fluctuations and inflation and its impact with reference to Indian economy. Stabilising inflation around certain preconceived level remains the predominant objective of monetary authorities all over the world as its variability has crucial ramifications on the real economy. However, the effective operation of monetary policy to this end largely hinges on the nature

and dynamics of inflation both in the short-run and longrun. In this context, the present study focuses on theoretical investigation of how crude oil price fluctuations affect inflation in a real economy

4 | Research Methodology:

This paper is completely a descriptive research and is based on secondary data. It includes compilation of research articles, books, journals, newspaper etc. I have taken necessary information and suggestion of expert, experienced personalities engaged with financial matters and related with import trade. Regarding budget, information collected from the analysis of different experts in respect of budget and its impact on the economy.

5 | Effects of rising crude oil prices on the Indian economy :

5.1 | Higher prices: adverse impact on fiscal deficit:

India imports 1.5 billion barrels of crude oil each year . This comes up to around 86% of its annual crude oil requirement. So, the surge in crude oil prices could increase India's expenditure, thus adversely affecting India's fiscal deficit - the difference between the government's total revenue and total expenditure. Fiscal deficit indicates the amount of money the government has to borrow to meet its expenses. A rise in fiscal deficit could negatively affect the economy as well as markets

5.2 | Impact on the rupee:

The rise in crude oil prices has a clear impact on the Indian rupee. If crude oil prices remain at these high levels, the rupee is further expected to depreciate by the year end. Rupee depreciation has a reverberating effect on the Indian economy and even the stock market.

5.3 | Impact on Sensex, midcaps:

A fall in crude-oil prices affects the input cost of producing these goods. Thus, a fall crude oil prices have a positive impact on the stocks. An impact on the prices of commodities affects companies. The recent decline in the crude oil prices has helped improve investor sentiments in Indian markets. The Indian stock markets have faced a lot of pressure due to this price rise.

5.4 | Impact on Current Account Deficit (CAD):

The rise in crude oil price has a big impact on the Indian Current Account Deficit (CAD). CAD is a measure of India's trade where the value of goods and services imported exceeds the value of goods and services exported. CAD essentially indicates how much India owes the world in foreign currency.

5.5 | Impact on stocks:

A lot of Indian companies depend on healthy crude oil prices. This includes tyre, lubricants, footwear, refining and airline companies. The profitability of these companies is adversely affected due to higher input costs. This could negatively impact stock prices in the near term. On the other hand, oil exploration companies in the country could benefit from a rise in oil prices.

5.6 | Impact on inflation:

Oil is a very important commodity and it is required to meet domestic fuel needs. And in addition to that, it is a necessary raw material used in a number of industries. An increase in the price of crude oil means that would increase the cost of producing goods. This price rise would finally be passed on to consumers resulting in inflation.

6 | The Determinants of Oil Prices :

With oil's stature as a high-demand global commodity comes the possibility that major fluctuations in price can have a significant economic impact. The two primary factors that impact the price of oil are:

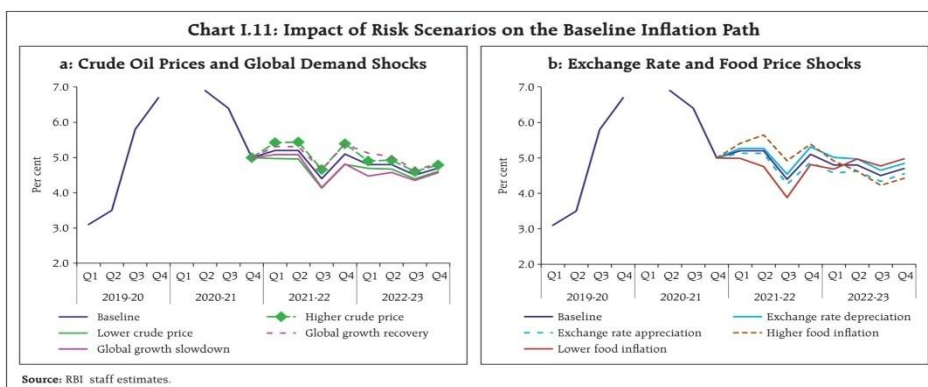
- Supply and demand
- Market sentiment

The concept of supply and demand is fairly straightforward. As demand increases (or supply decreases) the price should go up. As demand decreases (or supply increases) the price should go down. The price of oil as we know it is actually set in the oil futures market.⁵ An oil futures contract is a binding agreement that gives one the right to purchase oil by the barrel at a predefined price on a predefined date in the future. Under a futures contract, both the buyer and the seller are obligated to fulfill their side of the transaction on the specified date.

The other key factor in determining oil prices is sentiment. The mere belief that oil demand will increase dramatically at some point in the future can result in a dramatic increase in oil prices in the present, as speculators and hedgers alike snap up oil futures contracts. Of course, the opposite is also true. The mere belief that oil demand will decrease at some point in the future can result in a dramatic decrease in prices in the present as oil futures contracts are sold (possibly sold short as well), which means that prices can hinge on little more than market psychology.

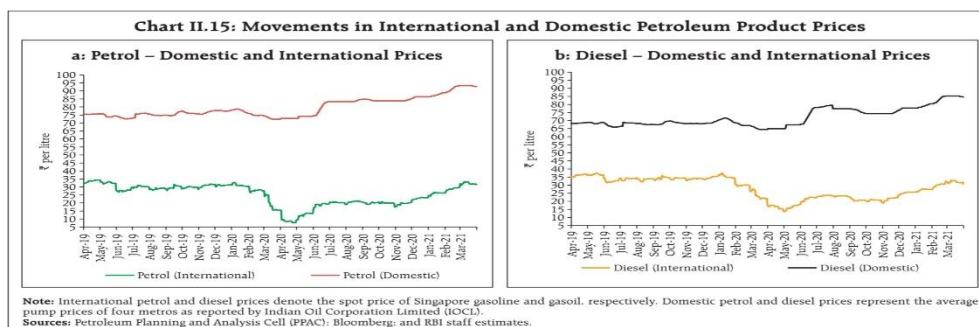
7 | International Crude Oil Prices :

International crude oil prices have risen sharply on production cuts and hopes of demand revival. For a net energy importer like India, the dynamics of international crude price movements have significant macroeconomic implications. A quicker containment of COVID-19 inducing higher global growth than the baseline and a faster closing of the global output gap along with sustained production cuts by the OPEC plus could lead to a sharper increase in international crude oil prices. Assuming crude oil price to be 10 per cent above the baseline, domestic inflation and growth could be higher by 30 bps and weaker by around 20 bps, respectively, over the baseline. Conversely, crude oil prices could soften if the recovery is more subdued owing to a faster spread of virus mutations, the delays in vaccination or improved supplies of shale gas. As a result, if the price of the crude falls by 10 per cent relative to the baseline, inflation could ease by around 30 bps with a boost of 20 bps to growth (Charts I.11a and I.12a).



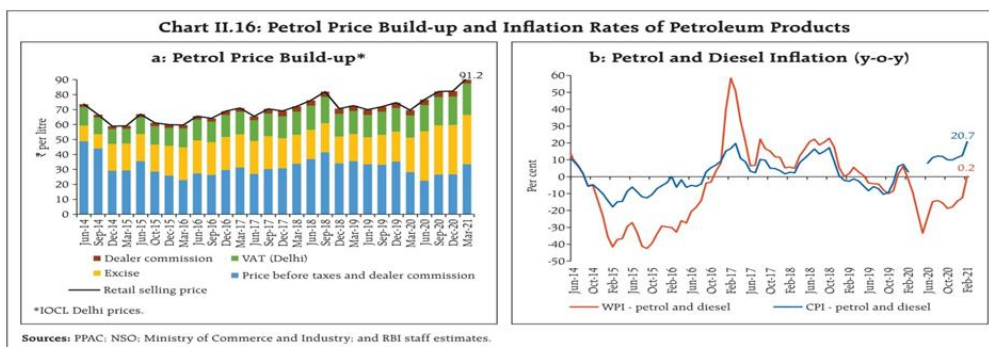
7.1 | Movements in International and Domestic Petroleum Product :

In H2:2020-21, crude oil prices (Indian basket) jumped by nearly 50 per cent—from around US\$ 41 per barrel in September 2020 to US\$ 61 per barrel in February 2021. This sharp rise in international prices, along with the non-reversal of the substantial post-lockdown hike in excise duties and value added taxes (VATs), resulted in domestic petrol and diesel pump prices reaching historical highs by February 2021 (Chart II.15b). The combined share of central excise and states' value added tax (VAT) in petrol prices has risen from `22 per litre (31 per cent) in mid-2014 & 38 per litre (54 per cent) in March 2020 to `53 per litre (61 per cent) in February 2021.



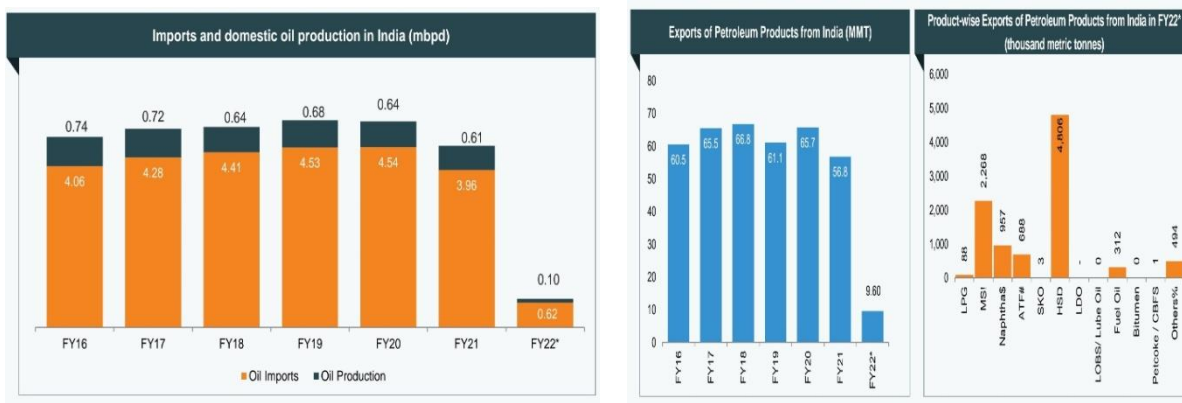
8 | Impact of Central and State Taxes on fuel price inflation :

The combined share of central excise and states value added tax (VAT) in petrol prices has risen from `22 per litre (31 per cent) in mid-2014 and `38 per litre (54 per cent) in March 2020 to 53 per litre (61 per cent) in February 2021 (Chart II.16a). While the WPI measures basic prices less trade discounts, thereby leaving out indirect taxes, retail prices are inclusive of taxes. CPI petrol and diesel inflation has been in double digits since July 2020 and was at 20.7 per cent in February 2021; in contrast, WPI petrol and diesel prices were in sharp double digit deflation for most part of the financial year, with February 2021 seeing a reading of only 0.2 per cent (Chart II.16b). Inflationary outcomes of oil price shocks—CPI inflation, WPI inflation.



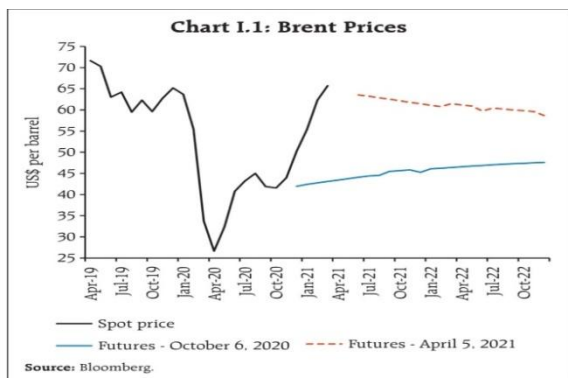
9 | Macroeconomic Effects of Oil Price Shocks:

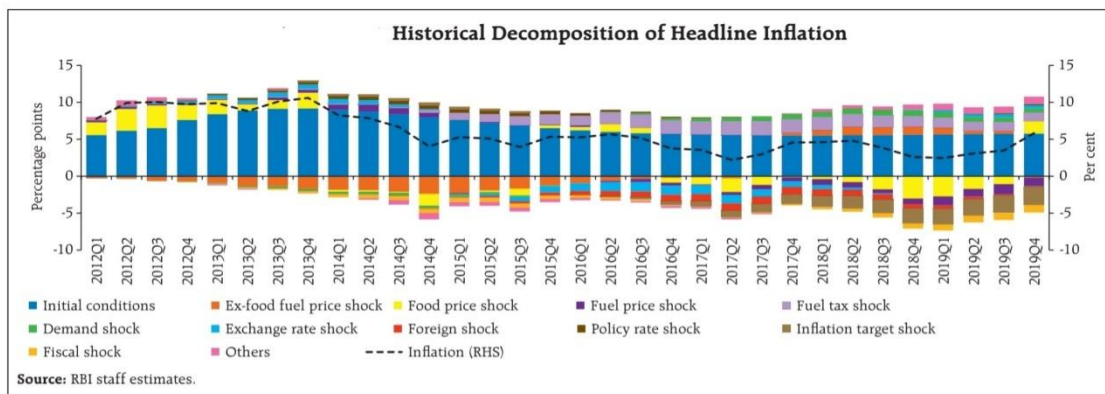
The rebound from the COVID-19 induced slump has been sharper than anticipated and economic activity is expected to rebound strongly in 2021-22. Headline consumer price index (CPI) inflation receded into the tolerance band beginning December 2020. Core inflation pressures remain elevated, reflecting pass-through from higher crude oil and non-oil commodity prices, high fuel and other taxes post-COVID and increased operating costs. The evolving COVID-19 trajectory and progress on vaccination remain the key drivers of economic activity and inflation, globally and in India. The following chart shows Oil supply and demand in India.



Global crude oil prices have hardened notably since November 2020 on the back of production cuts by the OPEC and non-OPEC allies (OPEC plus) and expected revival in demand with vaccine rollouts. Reflecting these developments as well as the attack on Saudi Arabia’s oil facilities, Brent crude crossed US\$ 70 per barrel in early March. Prices, however, corrected to around US\$ 65 in the second half of March over concerns of demand faltering on rising COVID-19 infections and increase in crude stockpiles. Taking into account these developments, crude prices (Indian basket) are assumed at US\$ 64.6 per barrel for 2021-22 in the baseline, 58 per cent above the October MPR baseline for 2020-21 (Chart I.1).

Global economic activity has improved relative to the outlook in October 2020 with vaccine rollouts and easing of lockdown restrictions, although it remains uneven across countries and sectors. The International Monetary Fund (IMF) in its January 2021 World Economic Outlook (WEO) update projected the global economy to expand by 5.5 per cent in 2021 (Chart I.2); the outlook remains heavily contingent upon the progress with COVID-19 containment measures and the scale and speed of the vaccination programme. The World Trade Organization’s (WTO) trade barometers suggest a moderation in global merchandise and services trade volumes from the marked improvement in Q4:2020.





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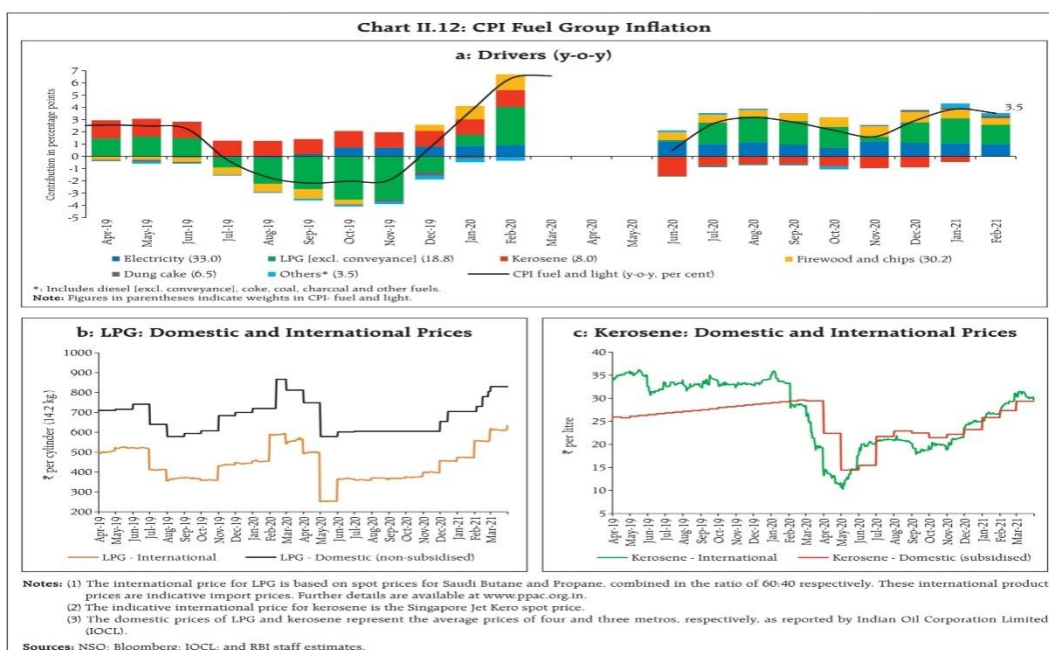
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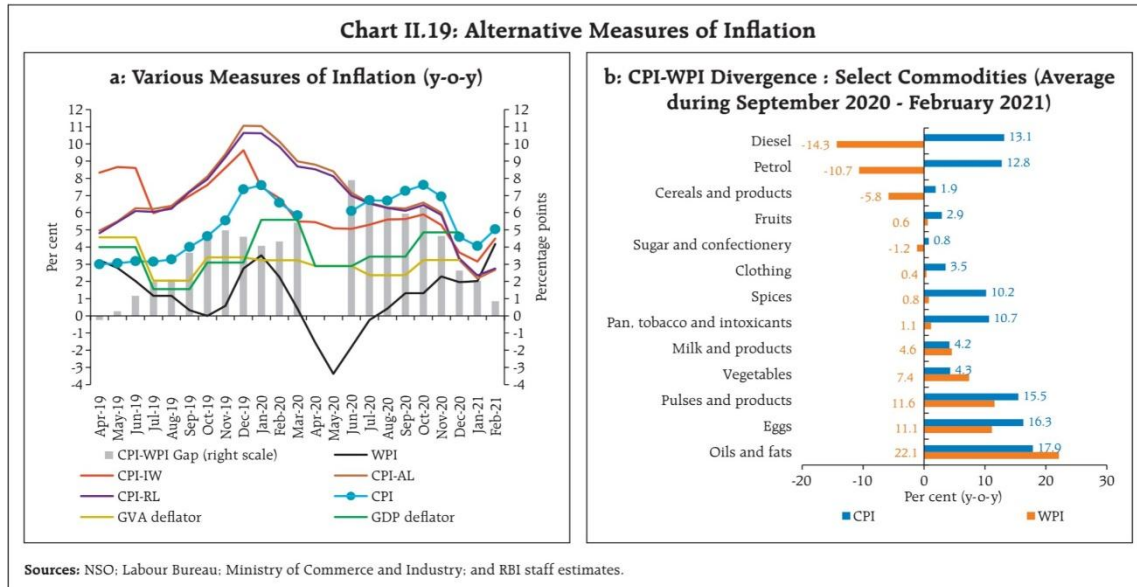
9.1 / Fuel prices accelerate CPI inflation :

Inflation in fuel prices initially moderated from 3.2 per cent in August 2020 to 1.6 per cent in November 2020, due to a decline in LPG and PDS kerosene prices and favourable base effects. As India recovers from the economic damage caused by the pandemic, it is also fighting a persistent surge in inflation. As measured by the CPI (Consumer Price Index, which includes the cost of food, housing, clothing, transportation, medical care and education, among others), inflation has almost doubled since June 2019, from 3.18 per cent to 6.26 per cent in June 2021. This was the second straight month in which inflation was above the RBI's (Reserve Bank of India's) targeted ceiling of 6 per cent, though it eased a bit in July to 5.59 per cent, a three-month low. Prices are up in every category, from food (specifically pulses and oil) to fuel and lighting. Food inflation was at 5.15 per cent in June, easing to 3.96 per cent in July, while edible oils and fats saw 34.78 per cent inflation in June and 32.53 per cent in July. (This category is very susceptible to international price swings because more than half of India's demand for edible oil is met through imports.) Fuel and light inflation was at 12.68 per cent in June, easing to 12.38 per cent in July. Fuel inflation then increased to 3.5 per cent in February 2021, led by prices of LPG, kerosene and dung cake (Chart II.12a). The movements in LPG inflation largely reflected the lagged impact of international prices (Chart II.12b). PDS-kerosene prices were in deflation throughout 2020-21, as international prices to which they are linked have been below pre-COVID levels since April 2020 (Chart II.12c).



9.2 / Fuel prices accelerate WPI inflation :

Wholesale Price Index (WPI) inflation calmed to 11.16 per cent in July (though for context, in July 2020, WPI was -0.25 per cent.) Fuel prices quicken WPI inflation & prices resurged to 11.39% in August, staying in the double digits for the fifth month in a row. Inflation in manufactured products escalated for the fourth month in a row to 11.4% as the second order effects of high fuel prices kicked in. The pace of price rise in fuel and power as well as primary articles firmed up to 26.1% and 6.2%, respectively, in August after a dip in July, even though food price inflation moderated from 4.46% in July to 3.43%. WPI food inflation decelerated continuously from September 2020 and fell into negative territory in January 2021 before moving up in February 2021 to 3.3 per cent. Average WPI food inflation during September 2020 to February 2021 at 3.7 per cent was way lower than average CPI food inflation at 6.6 per cent, with inflation across major food sub-groups, except vegetables, milk and products, oils and fats, recording lower prints in the WPI than in the CPI. The largest deviation between CPI and WPI emanated from inflation in petroleum products, especially in petrol and diesel, reflecting the wedge due to tax components.



Findings & Suggestions:

The study suggest that the oil price shocks have significant negative impact is there on Indian economic development activity in short and long run. However, it has perceived that each variable in a paper has given different response on crude oil price fluctuation. Variations in the results of these four variables may be accredited to their policies, macroeconomic essentials. This paper provides certain policy recommendations for Indian economist and policy maker. Initially, practically all macroeconomic variables (real GDP, interest rate, inflation and real exchange rate) under consideration of this research paper significant change had been there due to crude oil price fluctuation in short and long run time period to Indian economy. In this point the study strongly suggested that the government of Indian should take the realistic measures to avoid exogenous effects of crude oil prices. For that intention, Indian Government should suggest the energy consumption policy and implement new technologies that use unconventional energy so that they can expedite and invite domestic and as well as foreign direct investments in the India.

CONCLUSION:

In India, retail price of petroleum products are mostly under government control. The paper investigates that how oil price variations effect on the Indian economic system. A few years ago public sector oil marketing companies (OMCs) are forced to sell their products at prices below the costs of procurement at the refinery gate and are not allowed to modify the price of petroleum products based on the fluctuation of international crude market, resulting in under recoveries. In 2007–2008, the under-recoveries suffered by OMCs in selling kerosene, liquefied petroleum gas (LPG), petrol and diesel was Rs.771.23 billion. Government recently decontrolled petrol price at retail level and is planning to do the same for diesel. In India, as mentioned earlier, the price of petroleum products is insulated from the volatility of international crude oil price. The price of petroleum products in India is further distorted by heavy taxes imposed by government on consumers. However, as the study suggests, government's intension to curb inflation by insulating domestic petroleum price from international crude price fluctuation is ineffective as inflation anyway happens due to international oil price fluctuations through some other routes. The impact on inflation due to positive oil price shocks could be explained via the channel of worsening fiscal deficit due to oil subsidy. It is viewed that fiscally dominant governments running persistent deficits would sooner or later finance those deficits through creation of money, which will have inflationary consequences. Thus, the government deficit continues to be a key factor causing incremental reserve money creation and overall expansion in money supply, which lead to inflation in India.

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