

INFLUENCE OF CRUDE OIL PRICE ON MONETARY POLICY DECISIONS IN CONTEXT OF INDIAN ECONOMY

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Abstract: A country's Fiscal policy deals with revenue generation and public spending while Monetary policy is focused at controlling money flow in the market to maintain price stability and control inflation. Fiscal policy is a prerogative of the government and is generally liberal aimed at pleasing the vote bank by providing more money in the hands of people. This makes the policy inflationary in nature. On the other hand, monetary policy, a prerogative of RBI is focused at reining inflation. The RBI considers a large number of factors in determining its monetary policy and key rates. Since crude oil price plays a vital role in determining the street price of goods and commodities and consequently the inflation, it plays an important role in giving a final shape to the monetary policy. This paper validates the influence of crude oil price on the monetary policy by establishing a relationship between crude oil price and Inflation over a period of 14 years

Keywords: Crude Oil Price, Monetary Policy, Fiscal Policy, Inflation, Interest rates.

1. INTRODUCTION

The energy and transportation cost of any nation is dependent on the cost which it pays for meeting its crude oil requirement. The cost of raw material, manufactured goods and even basic necessities like fruits and vegetables increase with the increase in energy and transportation cost which ultimately depend on the crude oil price. Inflation and crude oil price thus have a significant cause and effect relationship. A developing country like India which imports over 70% of its crude oil requirement cannot be isolated from the volatility of the international crude oil price. A variation of one dollar in the cost of crude oil basket has an effect of Rs 40 billion on the Indian economy apart from reducing the subsidies on oil products like LPG and Kerosene.

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Oil prices have declined consistently from their peak in June 2014. Brent Crude has come down from USD 115 a barrel in June 2014 to less than USD 45 per barrel in Sep 2015. The declining crude helps the Indian economy in several ways:-

- Low energy and transportation cost means higher real income in the hands of consumers.
- Low input cost drives corporate profits and leads to higher investments.
- Lesser outflow of dollars leads to lowering of Current Account Deficit (CAD)

According to a report by Nomura, every 10 dollar per barrel fall in oil price can increase the GDP by almost one tenth of a percentage point. Due to the higher share of tradable goods in the WPI index, the impact of drop in oil prices is much higher on WPI inflation than CPI inflation. (inflation, 2014) Low oil price impacts more than 8.5 percent of the WPI basket when petroleum fuels excluding LPG and kerosene are considered and a further 5 percent is affected indirectly through lower price of crude derivatives such as chemicals. Thus a 10 dollar per barrel drop in price of crude oil will lower WPI by around 0.5 percent and CPI by about 0.2 percent. Consequentially, Every 10 dollar per barrel drop in price of crude oil will improve India's annual current account balance by around USD 9 billion or 0.5 percent of GDP. Petrol pricing is already market determined and oil marketing companies are currently generating over-recoveries ie. profits on diesel. This will reduce the government's fuel subsidy burden in FY15. The diesel subsidy, which amounts to about 0.3 percent of GDP in FY14, is likely to be eliminated going forward. (Money Control Bureau, 2014) The fuel subsidy hits the government financially and to meet the deficit the government borrows from the domestic market. This leads to higher funding cost which is transmitted to the system in the form of higher inflation. Deregulating fuel does not solve the problem completely because any increase in crude price will directly as well as indirectly impact household expenses again leading to inflation. Moreover, the falling crude price though directly beneficial to India, has an indirect adverse impact on its economy because of the down fall and economic gloom of the oil exporting countries and this is no good sign for a globally connected Indian economy. Thus a fine balance is needed.

2. LITERATURE REVIEW

India imports more than 66 percent of its annual crude oil requirement which constitutes around 30 percent of its overall total imports. Every one dollar fall in the crude oil price saves the country almost about Rs 40 billion. The fall in international oil prices will further lead to reduction in subsidies that help sustain the domestic prices of crude oil products like kerosene and LPG. Moreover,

falling crude oil price will provide adequate scope to the Reserve Bank of India in adopting growth oriented approach while formulating or reviewing monetary policy. It is estimated that a drop of 10 dollar in crude oil price could reduce the Current Account Deficit by almost 0.5 percent of the GDP and the fiscal deficit by around 0.1 percent of the GDP. Investment bank Nomura has estimated that the windfall to the extent of 40 dollar drop can potentially boost growth by up to 0.4 percent in the current financial year itself. A similar recent research report estimates that a 10 percent decline in oil prices could lead to a reduction in retail inflation (Consumer Price Index-based inflation) by almost about 0.2 percent and increase the GDP growth by 0.3 percent. (Kumar, 2015)

The direct relationship between oil and inflation became very evident in the mid 1970s, when the crude oil price increased from a nominal price of 3 dollar per barrel prior to the 1973 oil crisis to around 40 dollar per barrel during the peak of 1979 oil crisis. As a result of this, the consumer price index (CPI) which is a key measure of inflation, more than doubled from 41.20 in the beginning of 1972 to 86.30 by the close of 1980. In perspective it implies that while it had earlier taken almost 24 years from 1947 to 1971 for the CPI to double, it took just about eight years to double in the 1970s. This relationship between oil and inflation however, further deteriorated after the 1980s. During the Gulf War oil crisis in 1990s, crude prices almost doubled in six months from around 20 dollars per barrel to around 40 dollars per barrel, but fortunately the CPI remained relatively stable, growing from just 134.6 in January 1991 to 137.9 in December 1991. This disassociation in the relationship of Oil- CPI was even more apparent during the oil price jump from 1999 to 2005, wherein the annual average nominal price of crude oil rose from 16.56 dollar per barrel to 50.04 dollar per barrel. During this same period, the CPI rose from 164.30 in January 1999 to just 196.80 in December 2005. If we Judge by this data, it appears that the strong correlation between oil prices and inflation which existed in the 1970s was later weakened significantly. (Chad Langager, 2015) The effects of increase in crude oil price on commercial activities and inflation can be seen using the OECD's Global Model. Accordingly, a 10 dollar increase in the crude oil price would reduce the commercial activity in the OECD area in the second year after the price shock by two tenths of a percentage point and correspondingly increase inflation by about two tenths of a percentage point in the first year and by another one tenth in the second year. Higher crude oil prices also have tendency to adversely affect the growth because of the increase in the input costs and the adverse effect of increased oil price volatility on business investment. (OECD 2011)

Oil has always been an indicator for economic stability in modern times because of the Global high dependence on crude oil and related products. Moreover, the crude oil price is of critical importance in today's global economy, since crude oil is the largest internationally traded commodity, both in terms of volume as well

as in terms of value (this is often referred by some analysts as a “hydrocarbon economy”. Further, the prices of energy dependent and energy intensive goods and services are also linked to the energy cost and crude oil makes up the single most important share of the energy cost. The price of crude oil is also linked to some extent to the market price of some other fuels even though crude oil is not a full substitute for natural gas, coal, and electricity, more particularly in the transportation sector). For these very reasons, abrupt fluctuations in the price of oil, have a wide range of ramifications for both oil producing and oil consuming countries. As a result, most economists believe that there is a strong relationship between the growth rate of the global economy and the fluctuations in the crude oil price. However, whether or not the oil price can be seen as an economic indicator on GDP growth is not as clear. (M Anandan)

As the crude oil price decline, the market hopes the RBI to ease its monetary policy on expectation that inflation will decline. Amid government and industry pressure, the RBI governor Raghuram Rajan cut interest rate by 50 basis points on 29 Sep 2015. This was double of what was widely anticipated and the largest drop in more than three years. The interest rate cut brought down repo rate to 6.75 per cent, the lowest seen in four-and-half-years. (Times of India, 2015)

For a large net importer of crude oil like India, the decline in crude prices since June 2014 by about 50 per cent is a favourable external shock. Going forward, this could work towards improving growth prospects and easing inflation pressures further. A USD 50 per barrel decline in oil prices (Indian basket) sustained over one year could give rise to higher real income equivalent of about 4 per cent of total private consumption demand and about 2.9 per cent of nominal GDP. (Money Control Bureau, 2014) Assuming 50 per cent pass-through to domestic prices of petroleum products, the real income gain could enhance aggregate consumption demand by about 2 per cent and output by more than 1 per cent. In context of Indian corporate sector, particularly non-oil producing firms such as cement, electricity, iron and steel, chemicals, textiles and transportation, with more than 5 per cent of their total costs in the form of fuel, panel regressions show a statistically significant inverse relationship between profitability and oil prices. Estimates suggest that for a 10 per cent fall in oil prices output growth could improve in the range of 0.1-0.3 percentage points, while CPI inflation could decline by about 20-25 basis points below the baseline. (World Bank, 2015)

Economists and analysts have remained divided on the issue whether there will be any more rate cut this fiscal year, although there is unanimity that the Bank has turned dovish. The impact of an increase in service tax, which came into being since June 2015, is yet to display full results. Yet, the RBI governor has not ruled out further easing of interest rates, even mid-cycle, if conditions appear favourable. RBI Governor Raghuram Rajan explained at a post policy press conference that

CPI was a comparatively better measure for monitoring prices than WPI as it measured inflation in services and it also reflected inflation caused by domestic factors. (Rajan, 2014) In contrast, the WPI basket comprises of commodities that were experiencing disinflation or downward inflation due to global economic conditions, ruling out reverting to WPI as the preferred method for monitoring inflation. WPI does not take into account non-traded commodities, and this also contributes to making it a less efficient tool for measuring the inflation. The vast difference in composition of basket of items for CPI and WPI leads to the wide divergence of WPI and CPI. (Edwin, 4 Aug 2015) The recent dramatic fall in oil prices is a good for India. It saves around 50 billion dollars on an annual basis. This is roughly, one-third of our annual gross oil imports of about 160 billion dollars, said the RBI Deputy Governor while he was speaking at the Business Standard-Welingkar Institute awards function at Mumbai during Jan 2015. Conceding that there could be leakages and off sets in this number, he admitted that our external situation undoubtedly improved with the fall in oil prices. All this coupled with macroeconomic stability, provides an important backdrop for optimal decisions by all stakeholders. (The Hindu, 2015)

The fall in crude oil prices is largely due to subdued demand by the consumers and oversupply by some of the OPEC producers. Another reason is the increase in U.S. production from shale. Oil is critical for India primarily because India imports more than two-thirds of its requirement comprising 37 percent of total imports. A single-dollar fall in the crude oil price saves the country almost 40 billion rupees. That has a triple effect spread across the economy. First of all, if the average fall in oil prices is about 4 dollar per barrel in 2014-15, the trade deficit will shrink by about 3 billion dollars. Secondly, the fall in international oil prices will reduce subsidies that are necessary to sustain the domestic prices of various oil products. Petrol prices in India are already decontrolled. The more commonly used diesel has seen staggered deregulation since September 2012. However, kerosene and liquefied petroleum gas (LPG) that are still subsidized. Looking at the current mind frame of the government, they are unlikely to be deregulated in the near future. The total subsidy on petroleum products in the year 2013-14 was about 854 billion rupees. Consequently, the fiscal deficit in 2014-15 which is projected at 4.1 percent of GDP may be slightly reduced. Thirdly, the sustained fall in international crude oil price will have a soothing effect on inflation. (Panandiker, 2015)

3. THE ECONOMIC DILEMMA OF CRUDE OIL

3.1 Controlling Inflation

Inflation is directly dependent on the demand - supply situation but in the Indian context, keeping the supply side constant, inflation gets dependent on the

purchasing power of the population. Low crude price lowers inflation by reducing the input costs and thus the street price of goods and commodities but at the same time, if not controlled, creates inflationary pressure by increasing the disposable income in hands of people.

3.2 Current Account Deficit (CAD)

India imports over 70% of its crude oil requirement and low crude price certainly reduces the CAD by a reduction in dollar out flow. (RBI, 2014) This is good for Indian economy but on the flip side, the weakening economy of the developed nations due to sliding crude throttles the exports from India and has an adverse impact on the CAD.

3.3 Industrial Growth

Declining crude oil price will increase the disposable income in the hands of people on one hand and also reduce the price of goods due to lower input cost. The increased corporate earnings will offer additional tailwind for reviving business investment. If this opportunity is not capitalized to expand industries, the bottle neck on the supplies will be counterproductive and inflation will rise if supplies are not increased to meet the demand.

3.4 Market Sentiments and Volatility

Declining crude oil price leads to a general feel good factor in the market. The market discounts the earnings before the actual occurrence and if the crude oil price does not follow the predicted course, there is volatility in the market. There is time lag between change in crude oil price and revision of energy and transportation rates. Volatility in the duration between cause and effect proves disastrous as the effect may turn out to be contrary to expectations.

4. METHODOLOGY

Crude oil price impacts economy in several ways and every bright aspect has a dark side to it. An unqualified statement that low crude oil price is a boon for India would be half truth. The monetary policy decision is based on several factors, the prime being the inflation and inflationary trend. Therefore, by and large, the monetary policy decisions are linked to inflation and inflation is largely dependent on crude oil price. This paper is an attempt to quantify the impact of crude oil price on inflation and consequently on the monetary policy decisions by establishing a relationship between crude oil price and Inflation over a period of 14 years from 2000 to 2014. Karl Pearson's Coefficient of Correlation (Covariance method) has been employed to determine the variation in inflation as a result of variation in crude oil price. Mathematically. (Kothari, 2011)

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$$r = \frac{cov(x,y)}{\delta x \delta x}$$

For N pair of observations $(x_1, y_1), (x_2, y_2), \dots, (x_n, y_n)$,

$$r = \frac{\sum[(x - \bar{x})(y - \bar{y})]}{\sqrt{\sum(x - \bar{x})^2 \sum(y - \bar{y})^2}}$$

$$r = \frac{\sum(\delta x \delta y)}{\sqrt{\sum(\delta x)^2 \sum(\delta y)^2}}$$

Where,

r = Karl Pearson's coefficient of Correlation

$\delta x = x - \bar{x}$ and $\delta y = y - \bar{y}$,

The Probability of error is represented by:-

$$PE_{(r)} = \frac{0.6745(1 - r^2)}{\sqrt{N}}$$

If the value of r is less than PE then it is

Considered as insignificant

Further, Linear regression has been used to forecast the future cause and effect relationship between crude oil price and inflation and the linear regression is given by:- (Kothari, 2011)

$(Y)_i = a + b(X)_i + (\text{error})_i$ Where;-

$(Y)_i$ = value of average inflation for year i

a = mean value of inflation (intercept coefficient)

b = average change in inflation when one unit change in crude oil price (slope of crude oil price)

$(X)_i$ = value of crude oil price for year i

5. RESULTS

The results of regression analysis indicating average crude oil price and average inflation over the past 14 years are given at table 1 and table 2. Correlation between Average crude oil price and average inflation has been established at table-3. The probability output summary and Anova are illustrated where,

a = 2.45304359 (Intercept coefficient)

b = 0.07134505 (coefficient of value of crude oil price)

Regression equation is thus given by;-

$$Y = 2.4530 + 0.0731 (X) \text{ where;-}$$

Y is inflation and X is the crude oil price.

Adjusted R square = 0.5685 which measures the fit implying that 56.85% of inflation is determined by the crude oil price

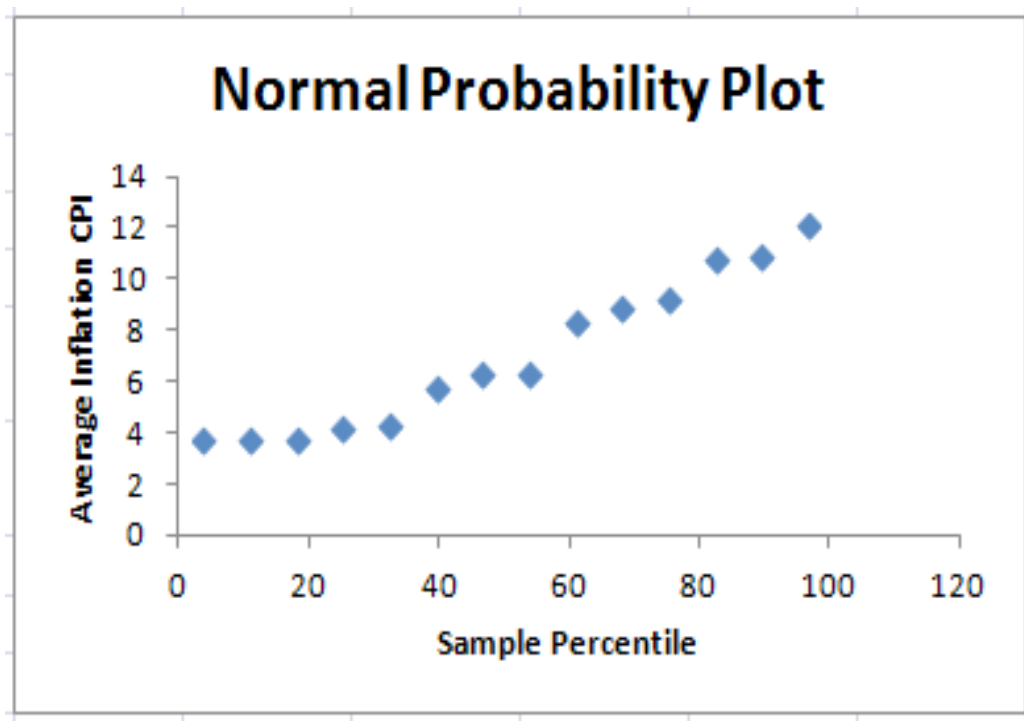
Thus, the results indicate that there has been 77.6 % correlation between crude oil price and inflation in the past and in future the dependence of inflation on crude oil price will be 56.85 %.

Table 1			Table 2		Table 3 (Correlation)		
Year	Average Crude Oil Price USD	Average Inflation CPI	Percentile	Average Inflation CPI	Average Crude Oil Price USD	Average Inflation CPI	
2k-2001	26.3	3.77	3.57142857	3.77	Average Crude Oil Price	1	
2001-02	21.9	4.31	10.7142857	3.77	Inflation CPI	0.7756990	1
2002-03	26.7	3.81	17.8571429	3.81			
2003-04	28.2	3.77	25	4.25			
2004-05	40.2	4.25	32.1428571	4.31			
2005-06	55.3	5.79	39.2857143	5.79			
2006-07	61.8	6.39	46.42857143	6.37			
2007-08	79.3	8.32	53.5714286	6.39			
2008-09	83.6	10.83	60.7142857	8.32			
2009-10	69.8	12.11	67.8571429	8.87			
2010-11	85.1	8.87	75	9.3			
2011-12	111.9	9.3	82.1428571	10.83			
2012-13	108	10.92	89.2857143	10.92			
2013-14	105.5	6.37	96.4285714	12.11			

Table 4		
Summary Output Regression Statistics		
Multiple R		0.775699
R Square		0.601708
Adjusted R square		0.568518
Std error		1.951182
Observations		14

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	69.01808292	69.01808	18.12872	0.001112
Residual	12	45.6853528	3.807113		
Total	13	114.7034357			

	<i>Coefficients</i>	<i>Std Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	2.45304359	1.20066205	2.043076	0.063645	-0.16297	5.06906	-0.16297	5.06906
Average Crude oil price USD	0.07134505	0.01675638	4.257784	0.001112	0.03484	0.10785	0.034836	0.10785



6. CONCLUSION

The government and Central Bank ie. (RBI), both are concerned about the inflation but the onus is ultimately taken by the RBI who tries to strike a balance between inflation and growth through its monetary policy. The empirical study of data over the past 14 years has clearly established that crude oil plays a significant role on the commodity price based inflation by having almost 78% correlation. Further, the trend indicates that in future crude oil price will influence inflation by almost 57%. Inflation being one of the prime concerns of the monetary policy, it is thus evident that the monetary policy decisions to a large extent will be affected by the crude oil price movement.

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