A Study on Impact of Crude Oil Price Fluctuation on Indian Economy

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ABSTRACT

Crude oil prices play a very crucial role on the economic growth of any country. India imports more than 70% of its crude oil requirement. In this paper we have taken many variable like Gross Domestic Product (GDP), Crude oil price (COP), and Wholesale Price Index (WPI). The objective of this paper is to examine the effects of oil price fluctuation on growth of Indian economy, using time series data from 2000 to 2014. Multiple linear regression models are used to analyze the data.

Keyword : Crude Oil price, Growth of Indian economy, Inflation, Imports of crude oil, balance of trade deficit, multiple linear regression.

INTRODUCTION

Indian economy is growing at fast pace so India's dependency in crude oil imports is increasing day by day. There was the dramatic rise in the prices of crude oil to as high as $148/bbl. In the international market in July 2008.In 2014 crude oil price was at low level as $ 84/bbl. Import of crude oil with higher price is increasing the balance of trade deficit in India. The purpose of this paper is to investigate the impact of crude oil price changes on economic growth in India.

FACTORS AFFECTING CRUDE OIL PRICES

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.

2.   **INTERNATIONAL ISSUES-** International issues like Russia Ukraine civil war affect 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.

LITERATURE REVIEW

Ibrahim Tuhran 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.Hidhayathulla , 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 t he 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 .

OBJECTIVE OF THE STUDY

1.   To analyze the trend in economic growth and crude oil price.

2.   To study the relationship between oil prices & inflation.

3.   To analyze the factors that affect to crude oil prices.

4.   To study the impact of oil price fluctuation on Indian economy.

5.   Impact of fluctuation in crude oil prices in Trade deficit of the Nation.

METHODOLOGY

Fluctuation in Oil price impacts the economy. This   study restricts itself to analyzing the direct impact of oil prices on the WPI and thereby on the GDP of   the country . Annual data from 2000 till 2013 has been considered for the study which has been obtained from the CMIE database. The variables that have been considered for the study and multiple linear regression are as follows:

GDPX: Log normal change in Indian GDP (in $)

COPX: Log normal change in Crude oil price per barrel (in $)

WPIX: Log normal change in Inflation measured in terms of Wholesale Price Index (WPI)

BOT Deficit: Log normal change in balance of trade deficit (in $)

$$\text{GDP} = \beta_0 + \beta_1 \text{ NCOP} + \mu \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\text{(1)}$$

$$\text{INF} = \beta_0 + \beta_1 \text{ NCOP} + \mu \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\text{(2)}$$

$$\text{BOT Deficit} = \beta_0 + \beta_1 \text{ NCOP} + \mu \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\text{(3)}$$
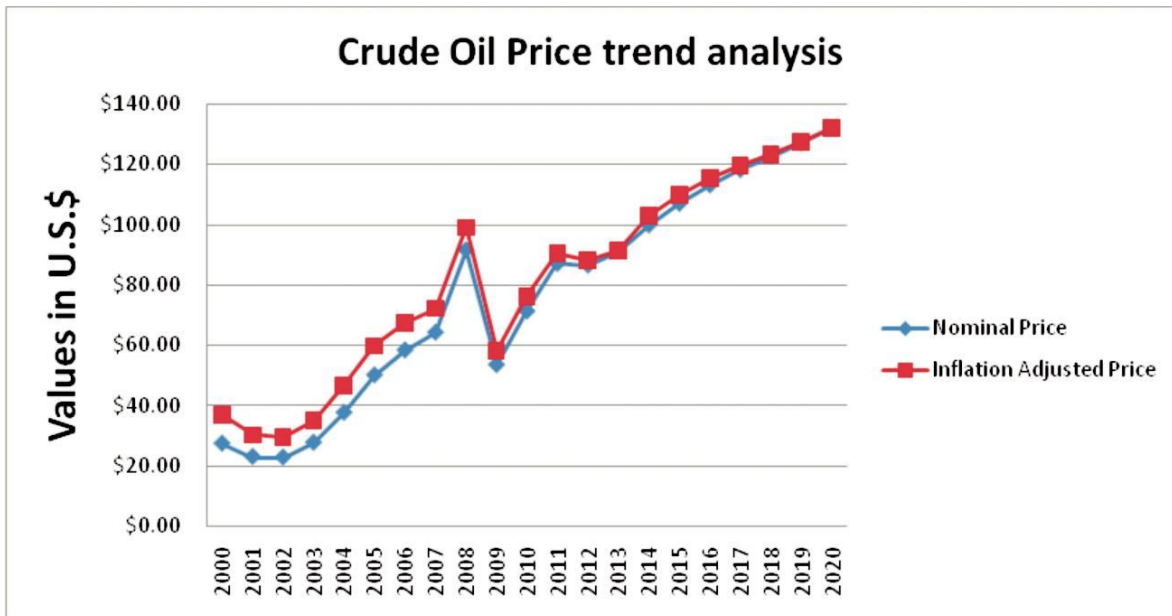
HYPOTHESIS: The hypothesis proposed here is as below:

There is a significant relationship between change in GDP growth, WPI change, BOT deficit and crude oil price change.

EMPIRICAL ANALYSIS

ECONOMIC GROWTH AND OIL PRICE TRENDS

Crude Oil Price trend analysis
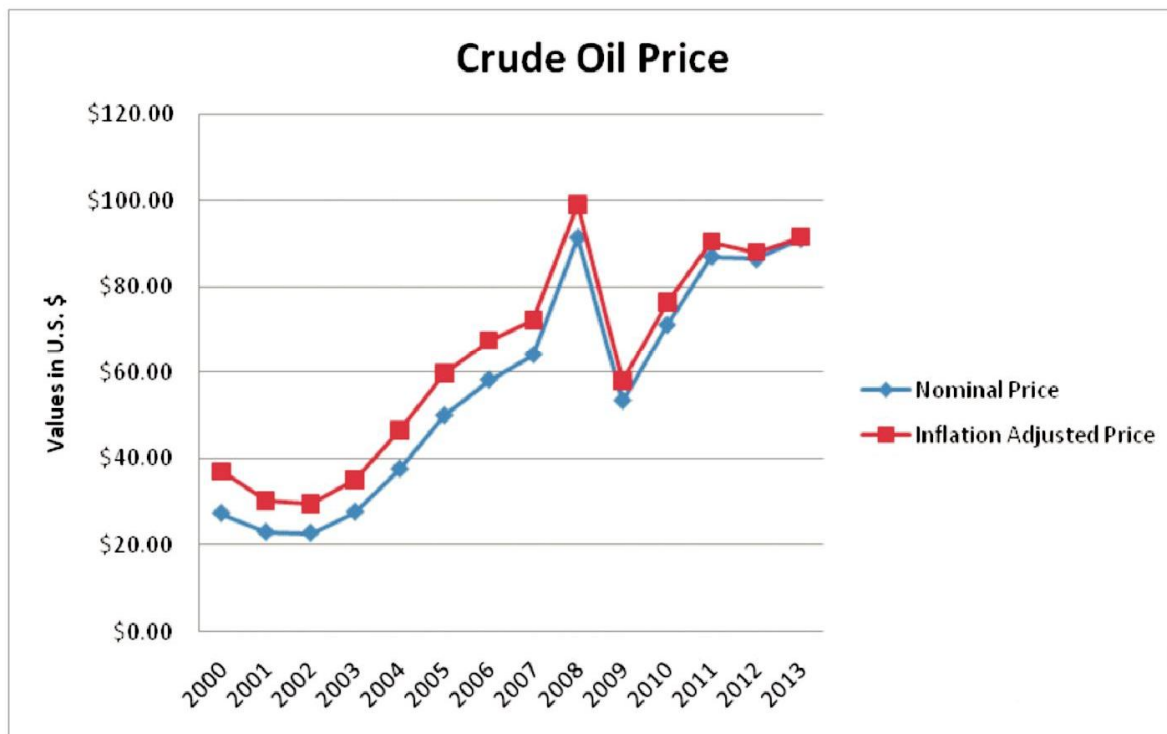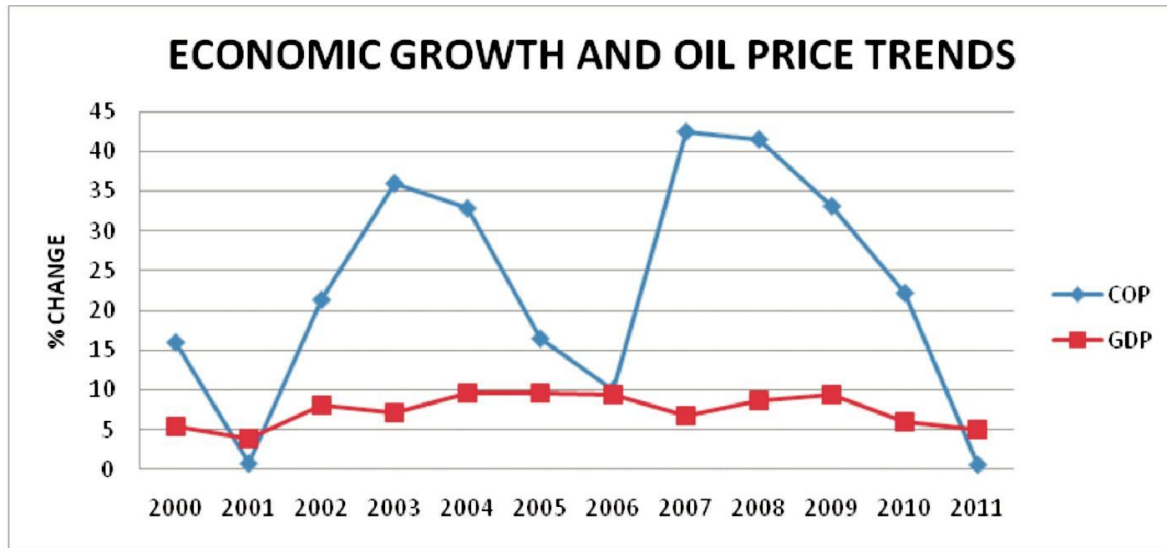
We can analyze that the future trend for crude oil rice in increasing year after year and in 2020 it will reach to 135$/bbl.

RELATIONSHIP BETWEEN ECONOMIC GROWTH AND OIL PRICES

$$GDP= \beta_0 + \beta_1 \, NCOP + \mu$$

$$GDP= (22.059) + (-.265) \, NCOP + \mu$$

From the above linear regression model we can analyze that if we change the value of nominal crude oil price by 1unit there would be a negative impact of .265 units on growth of Indian economy. We can state that There is a significant relationship between change in GDP growth and crude oil price change.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.265[a]	.070	-.008	4.06503	.070	.903	1	12	.361	1.222

a. Predictors: (Constant), Crude oil price

b. Dependent Variable: GDP

ANOVA[a]

	Model	Sum of Squares	df	Mean Square	F	Sig.
	Regression	14.918	1	14.918	.903	.361[b]
1	Residual	198.294	12	16.524		
	Total	213.211	13			

a. Dependent Variable: Crude oil price

b. Predictors: (Constant), GDP

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	22.059	8.514		2.591	.024
	Crude oil price	-2.043	2.151	-.265	-.950	.361

RELATIONSHIP BETWEEN INFLATION AND OIL PRICES

$$INF = \beta_0 + \beta_1 \, NCOP + \mu$$

$$INF = (-.905) + (.763) \, NCOP + \mu$$

From the above linear regression model we can analyze that if we change the value of nominal crude oil price by 1 unit so the inflation also increase by .763. We can state that There is a significant relationship between change in inflation and crude oil price change.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.763[a]	.582	.547	.32362	.582	16.677	1	12	.002	1.948

a. Predictors: (Constant), Crude oil price

b. Dependent Variable: Inflation

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.747	1	1.747	16.677	.002[b]
	Residual	1.257	12	.105		
	Total	3.003	13			

a. Dependent Variable: Crude oil price

b. Predictors: (Constant), Inflation

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.905	.678		-1.335	.207
	Crude oil price	.699	.171	.763	4.084	.002

RELATIONSHIP BETWEEN BALANCE OF TRADE DEFICIT AND OIL PRICES

$$BOT \, Deficit = \beta_0 + \beta_1 \, NCOP + \mu$$

$$BOT \, Deficit = 9.562 + .935 \, NCOP + \mu$$

From the above linear regression model we can analyze that if we change the value of nominal crude oil price by 1unit so the Balance of trade deficit also increase by .935 units. We can state that there is a significant relationship between balance of trade deficit and crude oil price change.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.935[a]	.874	.856	.17125	.874	48.379	1	7	.000	1.326

a. Predictors: (Constant), Crude oil price

b. Dependent Variable: Balance of trade deficit

ANOVA[a]

	Model	Sum of Squares	df	Mean Square	F	Sig.
	Regression	1.419	1	1.419	48.379	.000[b]
1	Residual	.205	7	.029		
	Total	1.624	8			

a. Dependent Variable: Balance of trade deficit

b. Predictors: (Constant), Crude oil price

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	9.562	.450		21.269	.000
Crude oil price	.840	.121	.935	6.955	.000

CONCLUSION

This paper examined the effects of oil price on Indian economy using time series data from 2000-2001 to 2012-13. India's imports of oil are mounting. Our import dependence has reached 80 per cent and is likely to keep growing. At the same time 2008 saw an record rise in oil price on the global market. Oil price unpredictability has also amplified. Though future oil prices are difficult to predict, they are generally expected to rise. Given our increasing dependence on imports effect to the Indian economy. By the increase in the price of crude oil the inflation increases, Government have to spend too much on subsidy , our exports become weaker , investment decreases and GDP is also affected.

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