

Impact of crude oil and US dollars price on the Indian stock exchange

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Abstract

The speed and magnitude of the oil price decline has the potential to trigger financial strains, which could reduce the global benefits of lower oil prices, although the effects have so far been contained. Countries and companies dependent on oil revenues have already been significantly re-priced, especially those with existing vulnerabilities, but the impact may not yet have been fully felt. In particular, a number of energy firms accumulated sizable debt during the period of high oil prices, and some banking systems saw a marked increase in loan exposures to the energy sector. Moreover, the redistribution of wealth among investors with varying saving and portfolio preferences could have market repercussions, and those effects will also take time to play out. For those concerned about market infrastructure, there does not appear to be evidence of dislocations in the oil markets so far. This article is an attempt to analyse the various factors which are responsible for effecting Indian Stock market.

Keywords: oil prices US dollar

stock

impact

1 Introduction

Oil prices have been persistently low for well over a year and a half now, but as the April 2016 World Economic Outlook will document, the widely anticipated "shot in the arm" for the global economy has yet to materialize. We argue that, paradoxically, global benefits from low prices will likely appear only after prices have recovered somewhat, and advanced economies have made more progress surmounting the current low interest rate environment.

Since June 2014 oil prices have dropped about 65 percent in U.S. dollar terms (about \$70) as growth has progressively slowed across a broad range of countries. Even taking into account the 20 percent dollar appreciation during this period (in nominal effective terms), the decline in oil prices in local currency has been on average over \$60. This outcome has puzzled many observers including us at the Fund, who had believed that oil-price declines would be a net plus for the world economy, obviously hurting exportters but delivering more-than-offsetting gains to importers. The key assumption behind that belief is a specific difference in saving behavior between oil importers and oil exporters: consumers in oil importing regions such as Europe have a higher marginal propensity to consume out of income than those in exporters such as Saudi Arabia.

World equity markets have clearly not subscribed to this theory. Over the past six months or more, equity markets have tended to fall when oil prices fall—not what we would expect if lower oil prices help the world economy on balance. Indeed, since August 2015 the simple correlation between equity and oil prices has not only been positive, it has doubled in comparison to an earlier period starting in August 2014 (though not to an unprecedented level).



FIGURE 1

Past episodes of sharp changes in oil prices have tended to have visible countercyclical effects—for example, slower world growth after big increases. Is this time different? Several factors affect the relation between oil prices and growth, but we will argue that a big difference from previous episodes is that many advanced economies have nominal interest rates at or near zero.

2 The effect of falling oil prices

It has to be taken in context with domestic and international economic events to draw a more realistic picture of India's economic outlook.

Conventional thinking dictates that since India imports

~80% of its energy resources, there should be a net positive effect on the economy for the following reasons.

Lower oil prices will cut inflation, and will bring down our Current Account Deficit. This cut in inflation would lead to a fall in commodity prices, which would ameliorate consumer spending. A decrease in inflation could lead to further cuts in interest rates, increasing credit availability in the economy and boosting overall growth prospects since there would be more money available for infrastructural and corporate investment. This may have been the motivation behind Xi Jingping recently fast-tracking 3000 infrastructural projects worth \$1.1 trillion in China.

Many sectors of the economy would directly benefit from the resulting lower cost of fuel (the agricultural and automotive sectors in particular would benefit).

The Fiscal Deficit is likely to lessen as well since less money would be funneled into the subsidies the Indian Government provides on fuel and related derivatives due to the lower cost of procurement of oil.

The decrease in inflation, and the overall improved outlook on India's economic growth would buoy investor sentiment.

Economist Glenn Maguire at Australia & New Zealand Banking Group thinks this "confidence multiplier" will lead to higher-than-expected growth. The drop in oil prices so far could add as much as 1 percentage point to global output. "We think this will be the defining, constructive dynamic that underpins Asian growth in 2015 and most probably 2016," Maguire says.

However, geopolitical imbalances can dilute this positive effect on the Indian economy due to its continued reliance on FII/FDI fund inflows from foreign countries whose economies may be adversely affected by the fall in oil prices. India is also a major player in the global export market, which could contract as a result of falling market demand and the imposition of curbs on imports by other countries. Defaults in loans given to Russia and to shale gas developers in the USA could lead to instability in the global banking industry, which could cause investors to err on the side of caution and pull money out of developing countries like India.

Fears about Greece exiting the Eurozone and a global stock market sell off perpetrated by a further slide in oil prices pulled the sensex down by 855 points on the 6th of Jan 2015 - its biggest fall in over five years. Falling crude prices - which dipped to below the \$50 per barrel mark for the first time since 2009 - also unnerved FIIs that aggravated the fall further, brokers and analysts said. The sensex closed at 26,987 and the session left investors poorer by Rs 2.76 lakh crore (about \$43.5 billion) with BSE's market capitalization now at Rs 96.6 lakh crore.

3 Oil prices and India

Oil is one of the most important commodities in recent times. Much of the economy depends on oil. This is why prices of oil matter to almost every economy. Global crude oil prices are down nearly 40% this year to \$60 per barrel-levels from \$110/barrel at the start of the year. This has caused a crisis in countries like Russia, which depends on oil exports.

Fall in oil prices affects India:

• Current account balance:

India is one of the largest importers of oil in the world. It imports nearly 80% of its total oil needs. This accounts for one third of its total imports. For this reason, the price of oil affects India a lot. A fall in price would drive down the value of its imports. This helps narrow India's current account deficit - the amount India owes to the world in foreign currency. A fall in oil prices by \$10 per barrel helps reduce the current account deficit by \$9.2 billion, according to a report by "Livemint". This amounts to nearly 0.43% of the Gross Domestic Product - a measure of the size of the economy.

• Inflation:

Oil price affects the entire economy, especially because of its use in transportation of goods and services. A rise in oil price leads to an increase in prices of all goods and services. It also affects us all directly as petrol and diesel prices rise. As a result, inflation rises. A high inflation is bad for an economy. It also affects companies - directly because of a rise in input costs and indirectly through a fall in consumer demand. This is why the fall in global crude prices comes as a boon to India. Every \$10 per barrel fall in crude oil price helps reduce retail inflation by 0.2% and wholesale price inflation by 0.5%, according to a "Moneycontrol" report.

• Oil subsidy and fiscal deficit:

The government fixes the price of fuel at a subsidized rate. It then compensates companies for any loss from selling fuel products at lower rates. These losses are called under-recoveries. This adds to the government's total expenditure and leads to a rise in fiscal deficit - the amount it borrows from the markets. A fall in oil prices reduces companies' losses, oil subsidies and thus helps narrow fiscal deficit. However, since diesel was recently deregulated, the fall in oil prices will likely have less effect on the government's fiscal deficit. Moreover, the government still has to pay for previous under-recoveries. Any benefit from the fall will be offset by payments for the past under-recoveries.

• Rupee exchange rate:

The value of a free currency like Rupee depends on its demand in the currency market. This is why it depends to a great extent on the current account deficit. A high deficit means the country has to sell rupees and buy dollars to pay its bills. This reduces the value of the rupee. A fall in oil prices is, thus, good for the rupee. However, the downside is that the dollar strengthens every time the value of oil falls. This negates any benefits from a fall in current account deficit.

• Petroleum producers:

The fall in global oil prices may be beneficial to India, but it also has its downsides. Directly, it affects the exporters of petroleum producers in the country. India is the sixth largest exporter of petroleum products in the world, according to media reports. This helps it earn \$60 billion annually. Any fall in oil prices negatively impacts exports. At a time when India is running a trade deficit - high imports and low exports, any fall in exports is bad news. Moreover, a lot of India's trade partners and buyers of its exports are net oil exporters. A fall in oil price may impact their economy, and hamper demand for Indian products. This would indirectly affect India and its companies. For example, the share prices of Bharti Airtel and Bajaj Auto fell because of the devaluetion of the Nigerian currency - Naira. Both the companies have a significant presence in the African country.

4 Oil and the dollar

Oil and the value of the U.S. dollar were the two assets that have the greatest impact on the day-to-day lives of most Americans. After all, the strength of the dollar is a quick way to gauge the strength of the U.S. economy relative to the rest of the world and we all feel the impact of oil prices, either at the pump or in prices of everyday products.

And for the last decade, the prices of these two assets have had an interesting - and perhaps surprising - relationship: they tend to move in opposite directions. Generally, when the price of oil rises the dollar falls, and vice versa. There is no one simple explanation for why these two assets tend to move in opposite directions. But understanding the complex forces that drive these two ubiquitous assets is nonetheless important for investors.

From a high point in February 2002, to a low point in March 2008 - when Wall Street banks were under tremendous stress - the value of the dollar relative to other major currencies fell by about a third. Meanwhile, U.S. Energy Information Administration data show that the price of West Texas Intermediate (WTI) oil, which is produced in the U.S., rose more than five-fold over the same time period. (The price of Brent crude oil, a more global benchmark for oil prices, more than quadrupled).





5 Oil-Dollar: Up and Down Game

But during the financial crisis, the directions reversed sharply. Between the bailout of Bear Stearns on March 14, 2008, and a turning point of the crisis in March 2009, the dollar's value increased 18 percent. Meanwhile, WTI prices fell about 60 percent.

Academic studies have been trying to understand this relationship. They show that even short-term market moves in either the dollar or crude oil affect the price of the other asset. For every 10 percent increase in the price of oil, the dollar declines 0.28 percent, European researchers wrote in a 2014 study. When the dollar declines 1 percent, oil prices nudge 0.73 percent higher, they found.

5.1 THE THINKING

The relationship between oil and the dollar is explained like this: Oil is an international commodity, bought and sold using U.S. dollars. When the value of the dollar rises, oil becomes more expensive for countries that have to exchange their own currencies into dollars to pay for it. People in those countries thus cut back on how much oil they use, and the oil price falls – simple supply and demand.

But some see the relationship differently. "There is little empirical evidence that the global demand for oil is in fact responsive to changes in the dollar," economist Christian Grisse wrote in a 2010 paper.

Both Grisse and the European researchers laid out a number of other possible explanations. One focuses on oil producers. When the dollar falls, exporting countries earn less money from sales of crude, and may raise prices.

Or perhaps it's the other way around: oil price moves bump the value of the dollar.

When oil gets more expensive, all goods and services requiring oil – either as a direct input or indirectly as in transportation costs – get more expensive. This puts pressure on the economy, slowing growth and ultimately weakening the dollar.

Along the same vein is another possibility that when foreign exchange investors see oil prices rising, they assume that the economy of the United States, currently a net oil importer and intensive energy user, will take a hit. They then bet on the appreciation of other currencies and the decline of the dollar.

5.2 THE COMPLICATED REALITY

Both Grisse and the European researchers conducted sophisticated analyses of oil prices, exchange rates, and other variables, such as interest rates. Both studies found that sometimes oil markets cause changes in the value of the dollar, and sometimes the dollar nudges the oil price. The correlation goes both ways.

The European paper also pointed out that big swings in other corners of the financial markets, such as the stock or bond market, can affect the prices of both oil and the dollar. In fact, between 11 and 25 percent of the movement in oil prices and the value of the dollar can be chalked up to price shocks that also affect other assets, according to the paper.

When the Chicago Board Options Exchange's Volatility Index (VIX) rises, for example, oil prices tend to fall and the dollar tends to rise. When the stock market gets rattled, investors will often flee to safe assets, like U.S. Treasury bonds. That tends to increase the value of the dollar, and thus, lower the price of oil, the researchers explain.

But perhaps the most important thing to note is that the inverse relationship between oil and the dollar is a relatively new phenomenon - and it has seemingly grown stronger over time.

Between 1984 and 2001, there was no evidence of a sustained link between the two assets, Grisse wrote. Sometimes, they rose and fell together. Other times, they moved in opposite directions.

The European researchers believe that the strengthening push-pull relationship between oil and the dollar over the last 15 years has been driven in part by the fact that oil has increasingly become a more accessible investment commodity.

They note that an increase in the number of open oil futures contracts (a measure of how many people are trading

around the future price of oil) prompts an increase in oil prices. They also note that in the early 2000s, when the inverse relationship between oil and the dollar began strengthening, a variety of exchange-traded funds, index funds, futures and options linked to the price of oil also became more popular among investors.

Though there is no easy explanation for the increase in trading of oil-linked products, one study by researchers at the Oxford Institute for Energy Studies suggests that when investors anticipate either greater demand or tighter supply, trading in oil-linked financial products tends to increase.

In the early 2000s, China's rapidly growing economy led to a major increase in oil demand, and production did not keep pace. Global oil consumption rose 12.7 percent between 2000 and 2007, while supply rose just 9.6 percent, according to statistics from the Energy Information Administration. With relatively tight supply keeping upward pressure on prices, it's conceivable that investors simply wanted to cash in on an appreciating financial asset.

6 Oil prices and the stock exchange

There are many empirical studies on the relationship between changes in oil price and stock market return. These mostly suggest an inverse relationship between these two variables for developed as well as emerging markets (Ciner, 2001; Jones et al, 2004; Basher and Sadorsky, 2006; Ewing and Thompson, 2007; Aloui et al, 2008; Driesprong et al, 2008; Park and Ratti, 2008; O'Neill et al, 2008; Nandha and Faff, 2008; Miller and Ratti, 2009; Chen, 2009; and Filis, 2010; among others). The inverse relationship is justified as follows: when the oil price goes up because of a supply-side shock, the cost of doing business rises and stock price factors this to account for the drop in earnings. Many other studies which consider the demandside shock, on the other hand, report a direct relationship between oil price and stock market return (El-Sharif et al, 2005; Kilian and Park, 2009; Narayan and Narayan, 2010; Filis et al, 2011; Arouri and Rault, 2012). These studies indicate that a demand-side shock driven by global economic expansion leading to a higher oil price has a positive effect on stock market return. There are also studies showing that an oil price change may leave the stock market return unaffected (Huang et al, 1996; Bernake et al, 1997; Blanchard and Gali, 2007; Cong et al, 2008; Lescaroux and Mignon, 2008; Apergis and Miller, 2009; Al-Fayoumi, 2009; Miller and Ratti, 2009; and Jammazi and Aloui, 2010; among others.

After the oil price bubbles of early 2000, many countries started looking for means to insulate the price level against any kind of shocks (including oil price shocks). Moreover, technology advancement and the associated rise in firm productivity, R&D investment in renewable energy and non-conventional or advance fuels, and greater wage flexibility in some countries also played an important role in reducing the impact of oil price rise (Filis et al, 2011). Additionally, developed economies like the USA are now less dependent on oil than they used to be 30 years back. Thus, earlier empirical studies offer mixed support for the relationship between oil price and the stock market.

Over the last three decades or so (January 1986–January 2012), crude oil prices in the international market (measured here by the price of West Texas Intermediate, or WTI, crude oil) rose considerably from the level of US\$10-15 per barrel (/bbl) to US\$145/bbl. However, this rise took place mostly between January 2003 and July 2008, when the price reached US\$145/bbl. The post-2003 rise in oil price, which hit a record high of US\$145/bbl in July 2008, is ascribed largely to increasing demand for crude oil from Chinese and other emerging economies. This coincided with a phase of decline of the US dollar against major traded currencies and a phase of rising stock prices in emerging markets. After that, because of the onset of global recession in late 2008, oil price plunged to US\$34/bbl in February 2009. Following the subsequent improvement of the global economy and cutting down of OPEC supply, oil prices started rising again, now with a fair amount of temporal fluctuation, during 2009-2011. One would expect this kind of instability of crude oil price to affect financial and foreign exchange markets and also cause macroeconomic distortions in net oil-importing countries like India.

For India, a rise in global oil price may have a direct effect on the inflation rate and the trade balance, leading to a higher current account deficit and a deteriorating net foreign asset position. At the same time, a higher oil price may induce wage demands to offset the higher cost of living. This may also lead to a decline in private disposable income and corporate profitability, and thus reduce domestic demand and stock prices while also pulling down the exchange rate. In India, consumption of petroleum products in the year 2000 was 2,127.4 thousand barrels per day (TBD), which rose to 3,116.2 TBD in 2010. The corresponding domestic production figures were 770.1 and 953.9 TBD. This increased dependence on import led to a rise of the import bill from US\$79.55 billion in 2009-10 to US\$106 billion in 2010-11, the two figures being about 3 per cent and 2.8 per cent of GDP for the years 2009 and 2010, respectively. As International Energy Agency (IEA) estimates suggest, a US\$25 to US\$35 rise in the oil price causes a two-year drop in GDP of 0.3 per cent for the US, 0.4 per cent for Japan and 0.5 per cent for the euro zone. This sensitivity for the Indian economy may not be negligible. CRUDE OIL PRICE - BSE 30 (BSE SENSEX) (*BSESN) Jan 6, 2012 - Apr 1, 2016





FIGURE 3 Crude Oil (\$) vs BSE Sensex (x1000)

7 Impacts of Rupee depreciation

• Increase in Import Bill

A depreciation of the domestic currency results in higher import costs for the country. Failure of a similar rise being experienced in the prices of exportable commodities is going to result in a widening of current account deficit (CAD) of the country.

• Higher inflation

A weak rupee will increase the burden of Oil Marketing Companies (OMCs) and this will surely be passed on to the consumers as the companies are allowed to do so following deregulation of petrol and partial deregulation of diesel. If the OMCs increase fuel prices, there will be a substantial increase in overall cost of transportation which will stoke up inflation.

• Direct Impact on Consumers

- a) gold has become more expensive and hit an all-time highs first three quarters of 2013;
- b) travel expenses rise as crude oil gets costlier;
- c) foreign Travel and Overseas Education becomes costlier: Students who are studying abroad will bear the brunt most owing to depreciating rupee. Expenses incurred towards the niversity/college fee as well as that of living will shoot up, thereby spelling a huge burden on the students;
- d) inflation leading to price rise in essential goods.

• RBI's monetary policy

If the depreciation in rupee continues, it will further increase inflation. In such a situation RBI will have very less room to cut policy rates. No cut in policy rate will add to the borrower's woes who are eagerly waiting to get rid of the high loan regime. If RBI cuts rates further, the interest rate arbitrage (between Indian government bonds and US Treasury yields) becomes less attractive, thus compromising the possibility of further capital flows.

• Current Account Deficit

- a) exporters refrain from repatriating export proceeds because they knew that the dollar would earn more rupees if they wait a little longer;
- b) those holding stashed funds abroad continue to hold them in perpetuity. They watch the situation in silent appreciation, as they witness the rupee sinking to new depths effortlessly;
- c) repatriable yield in dollar terms of foreign investors (foreign direct investments as well as portfolio investments) diminishes, thereby dampening the investment climate in India;
- d) foreign currency non-resident (FCNR) deposits become less attractive for banks since the swap cost of funds soars due to a higher forward premium of the dollar;
- e) NRIs tend to avoid non-resident external (NRE) repatriable rupee deposits since repatriable yield in dollar terms diminishes.

• Capital Account deficit – Lower FII Investments and Lower FDI

The rupee's weakness may make foreign investors think twice before investing. Foreign capital inflows are typically at risk when the local currency weakens. Portfolio flows into both debt and equity will taper, with investors subscribing to the view that the local currency could depreciate further. This shoots up the Capital Account Deficits.

• Higher burden of Debt for Companies and Government

The interest burden would increase on foreign currency denominated debt. For companies that have availed of foreign currency loans for implementation of projects, the rupee depreciation will stretch their balance sheets, as the amount of debt will increase in rupee terms. As these loans mature, the cash flows will also be impacted. According to government statistics, out of India's \$376 billion outstanding external debt, about 23% or \$85.3 billion comprises external commercial borrowings, or ECBs. Similar behavior can be observed in case of Government for repaying and servicing foreign debt.

• Slowdown of growth and Unemployment

Falling rupee is a recipe for slowdown in economic growth. If the fall of rupee continues, the foreign investment will dry in India thereby creating a gap between investment required for growth and the actual investment made. Although this does not impact immediately, over the period, unemployment rises in the economy.

• Volatile domestic equity market

Our equity market has been volatile for some time now. Equity is nothing but the investments in Indian companies made by Foreign Institutional Investors (FIIs). Some examples of Private equities investing in India areBlackstone, IFC, Berkshire Hathaway etc. So, the FII's are in a dilemma whether to invest in India or not because of the lack of overall confidence in the Indian economy. Even though they have brought in record inflows of dollar to the country this year, chances are they may be thinking of taking their money out of the equity market, which might again results in less inflow of dollars in India. Therefore, decrease in supply and increase in demand of dollars results in the weakening of the rupee against the dollar.

• Exporters

Importers will strongly feel the pinch of falling rupee as they will be forced to pay more rupees on importing products. Conversely, a feeble rupee will bring delight to the exporters as goods exported abroad will fetch dollars which in return will translate into more rupees. Also, a weak rupee will make Indian produce more competitive in global markets which will be fruitful for India's exports.

8 Research methodology

Research Type:

<u>Descriptive Research</u>:- Is a study designed to depict the data in an accurate way more simply put, descriptive research is all about describing data included in study.

Secondary Data:- Websites, Journals, Internet etc Sample year:- 2006-2016, 10 years (121 months).

9 Objective of the study

- ✓ Understanding the relationship between Crude Oil Prices, US Dollars and Indian Stock Exchange (BSE/NSE) by using various Statistical techniques.
- Finding the Standard Deviation from the Mean of all the entities.
- ✓ Studying the Variance and Co-Variance of all the entities.
 - 1) to study Correlation between
 - 2) Crude Oil Prices and US Dollars;
 - 3) US Dollars and Indian Stock Exchange (BSE/NSE);
 - 4) Crude Oil Prices and the Indian Stock Exchange (BSE/NSE).

10 Data analysis

Months	Oil Prices (\$)	US Dollars (\$)	Sensey (INR)
1-Anr-06	<u>69</u> 77	44 79	11623.99
1-May-06	71.35	45.60	11250.10
1-1/10y-00	71.86	46.04	10126.89
1-Jul-06	74.60	46.04	10551 56
1 Aug 06	72.60	46.51	11210.24
1 Son 06	72.09 65.95	40.51	1219.24
1-Sep-00	03.83	40.15	12020.84
1-Oct-06	60.35	43.35	120/2.39
1-Nov-06	60.09	44.81	13356.33
1-Dec-06	61.99	44.42	13588.38
1-Jan-07	57.64	44.21	13886.96
1-Feb-07	59.64	44.09	13646.81
1-Mar-07	62.97	43.65	12947.22
1-Apr-07	64.95	42.02	13373.39
1-May-07	64.18	40.78	14165.74
1-Jun-07	67.44	40.54	14472.79
1-Jul-07	74.15	40.40	15185.97
1-Aug-07	74.85	40.66	14996.23
1-Sep-07	78.24	40.17	16344.40
1-Oct-07	87.48	39.45	18644.43
1-Nov-07	92.90	39.39	19470.12
1-Dec-07	92.13	39.41	19804.65
1-Jan-08	93.50	39.37	18628.29
1-Feb-08	95.62	39.61	17688.12
1-Mar-08	103.42	40.06	16194.20
1-Apr-08	108.63	40.16	16459.43
1-May-08	121.84	41.55	16976 86
1-Jun-08	133.23	42.59	15022.83
1-Jul-08	132.99	42 64	13869.97
1-Aug-08	119.87	43.03	14552 75
1-Aug-00	109.45	45.05	13633 50
1-0ct-08	83.45	48.07	10924.01
1-Nov-08	60.46	48.00	9640.97
1-Doc-08	46.56	48.77	9366 56
1 Jan 00	40.50	48.74	0561 52
1-Jail-09 1 Eab 00	42.14	40.09	9301.33
1-rep-09	41.34	49.75	9149.62
1-Mar-09	47.05	50.10	9101.41
1-Apr-09	49.45	50.10	10546.85
1-May-09	58.58	48.38	13205.08
1-Jun-09	68.68	47.59	14/14.40
1-Jul-09	67.52	48.21	14/82.39
1-Aug-09	69.87	48.15	15512.08
1-Sep-09	69.67	48.32	16529.34
1-Oct-09	/4.36	47.08	16595.21
1-Nov-09	76.94	46.67	16346.47
1-Dec-09	/6.33	46.41	1/130.25
1-Jan-10	77.23	46.12	16900.96
1-Feb-10	/5.63	46.21	162/2.53
1-Mar-10	81.38	45.45	17049.42
1-Apr-10	84.28	44.53	17609.60
1-May-10	77.89	45.62	16994.63
1-Jun-10	74.62	46.42	17220.43
1-Jul-10	76.28	46.59	17795.19
1-Aug-10	76.15	46.56	18044.42
1-Sep-10	75.88	45.79	19097.84
1-Oct-10	81.24	44.41	20187.49
1-Nov-10	83.56	45.00	19964.30
1-Dec-10	87.68	45.26	19916.42
1-Jan-11	90.36	45.24	19413.16
1-Feb-11	94.11	45.49	18058.79
1-Mar-11	101.72	44.91	18698.71
1-Apr-11	110.01	44.33	19346.60
1-May-11	106.51	44.71	18691.83
1-Jun-11	97.76	44.84	18390.19
1-Jul-11	96.22	44.37	18608.93
1-Aug-11	89.83	45.02	17308.65
1-Sep-11	83.89	47.57	16607.56
1-Oct-11	85.43	49.13	16903.64
1-Nov-11	96.37	50.51	16711.24
1-Dec-11	98.58	52.59	16037.61
1-Jan-12	99.83	51.34	16336.30
1-Feb-12	102.71	49.24	17629.41

Month	Oil Prices (\$)	US Dollars (\$)	Sensex (INR)
1-Mar-12	105.63	50.09	17520.03
1-Apr-12	103.58	52.62	17355.76
1-May-12	95.93	51.72	16707.88
1-Jun-12	83.93	55.26	16711.23
1-Jul-12	86.94	54.44	17226.13
1-Aug-12	92.43	55.89	17418.38
1-Sep-12	94.49	55.93	18087.27
1-Oct-12	89.18	55.43	18705.18
1-Nov-12	87.22	55.41	18864.05
1-Dec-12	89.47	55.56	19382.69
1-Jan-13	94.76	55.58	19780.26
1-Feb-13	94.80	54.23	19382.35
1-Mar-13	93.92	54.22	19008.89
1-Apr-13	93.56	53.06	19040.47
1-May-13	93.08	53.04	19778.63
1-Jun-13	94.64	54.39	19395.60
1-Jul-13	101.75	54.39	19544.02
1-Aug-13	106.84	54.58	18770.23
1-Sep-13	105.29	54.66	19244.37
1-Oct-13	99.76	54.12	20271.68
1-Nov-13	94.37	54.18	20852.49
1-Dec-13	96.11	53.69	20998.60
1-Jan-14	96.55	53.77	20872.37
1-Feb-14	100.01	54.42	20675.70
1-Mar-14	101.79	54.13	21713.43
1-Apr-14	101.28	55.19	22502.46
1-May-14	101.42	58.27	23590.90
1-Jun-14	104.41	60.05	24947.20
1-Jul-14	101.83	63.87	25639.27
1-Aug-14	96.21	64.73	26074.81
1-Sep-14	93.33	61.92	26734.79
1-Oct-14	86.08	62.32	27088.10
1-Nov-14	73.35	61.88	28299.74
1-Dec-14	60.31	62.28	27881.68
1-Jan-15	50.17	62.27	28322.25
1-Feb-15	49.57	60.95	29027.49
1-Mar-15	47.89	60.26	28691.03
1-Apr-15	53.52	59.49	27739.58
1-May-15	59.80	59.67	27382.06
1-Jun-15	59.60	60.18	27456.86
1-Jul-15	52.94	60.84	27983.23
1-Aug-15	45.79	61.15	27022.05
1-Sep-15	46.32	61.52	25896.81
1-Oct-15	46.37	61.81	26696.97
1-Nov-15	43.86	62.68	26265.77
1-Dec-15	38.75	62.52	25860.74
1-Jan-16	33.95	61.94	25252.31
1-Feb-16	32.08	62.20	23870.29
1-Mar-16	36.88	62.88	24277.00
1-Apr-16	37.38	63.74	25309.52

11 Graphical representation



FIGURE 4 Oil(\$) vs USD yearly data 2006-2015



FIGURE 5 USD vs Sensex in \$ yearly data 2006-2015

12 Data analysis (findings)

14 Conclusion

Number of Months (Count) = 121

Values	Oil Prices (\$)	US Dollars (\$)	Sensex (INR)
Mean	80.08	50.43	18448.39
SD	21.90	7.14	5008.52
Variance	479.43	51.02	25085316.44
Skewness	-0.21	0.37	0.36
Kurtosis	-0.47	-0.99	-0.40

Correlations:

- Between the price of Crude Oil and USD = -0.30
- Between the price of Crude Oil and Sensex = -0.10
- Between USD and Sensex = 0.73

13 Interpretation of the analysis

Correlations:

- as per the analysis, Crude Oil prices and US Dollar prices have a "Negative Correlation" if one goes up the other goes down and vice-versa.
- Crude Oil prices and the Sensex have a "Negative Correlation" if one goes up the other goes down and vice-versa.
- US dollar prices and the Sensex have a "Positive Correlation" as one goes up or down the other follows.

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The findings of this study conclude that despite the India's aggressive economic growth in the past fifteen years, the volatility of stock prices in India have a significant impact on the volatility of oil prices. While dynamics in the oil prices not impacted the price creation process of equities in Indian stock markets. India is quite unique in a sense that they are less affected by the recent Global financial crisis. Also, there are macroeconomic factors that have had a strong impact over equity returns and volatility in these equity markets. These factors appear to have had a much greater role in shaping the equity price dynamics in India

than global oil price movements. For determining the impact of Exchange rate on Indian Stock Market, monthly data has been employed and, firstly correlation test is applied which indicates that there is negative impact of exchange rate (USD/INR) on Indian stock market (SENSEX). There is very less degree of positive correlation between stock indices and foreign exchange rates. There is no significant relationship between the exchange rate and stock indices and the two are affected by various factors in spite of the increasing integration between the two markets.