Crude Oil Price Fluctuations On Sectoral Stock Indices In Indian Stock Market- An Empirical Analysis

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Abstract

The boundless, mounting demand and prominence of oil globally, have steered to its highly complex market and pricing system. To discipline inflation and to sustain the rapid growth of the economy, the role played by oil is very vibrant. Almost all modern-day activities are led by the price of crude oil, notwithstanding the call for green energy. As one of the countries that import the most oil, India relies heavily on oil imports. The nation is positioned as 3rd largest consumer of crude oil after China and the United States of America. India has newly adopted a pricing contrivance for its petroleum products which replicates the global crude prices. The precariousness of crude oil prices drove many corporations away and it distresses the stock market also. Identification of the factors behindhand this complex market system is vivacious as it can succor in policy and critical decision making. The goalmouth of this study is to explore the impact of crude oil price movements on sectoral stock indices. Hypothesis testing is done with the help of Kendall's tau-b correlation using SPSS and the relationship between stock indices and oil prices were found out.

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Introduction

Oil plays a sizable and vital position in our society and represents much ampler than just one of the main energy sources used by humans. The price of oil normally refers to the spot price of a barrel of benchmark crude oil. Moreover, being an important energy source, petroleum products function as feedstock for several consumer merchandises, thus playing a developing and relevant role in the lives of mankind. The economic performance of the country is closely related to oil price shocks. As a price determinant, crude oil affects a wide range of commodities and society as a whole when its price rises or falls. There has been an increase in the domestic consumption of oil products over the past few years. The emergence of major oil producing companies overtime subjugated the global market scenario and later were occupied by governments of various countries. The decisions of the government coupled with that of associations like the Organization of Petroleum Exporting Countries, (OPEC), Organization for Economic Co-operation and Development (OECD), confrontations, wars and geopolitical conflicts, futures market contracts, speculators in the commodity market, refinery capacities, dollar value and the weather economic and industrial development affected crude oil prices. The price of crude oil changed over time and cannot be accredited to one specific market factor as it has spawned an approvingly complicated market system which was dependent on quite a few factors.

Contrariwise, the oil manufacturing during drilling, production, refining and transportation which holds a foremost potential of hazards for the environment and accordingly all living creatures on our earth. The first oil price shock was during 1973, which caused the drastic escalation in global demand in consort with the development of new energy-related technologies and new energy resources like solar energy, caused the global consumers more repellant to oil.

Whilst the economy adapted to the pandemic, the surge in inflation rates manifested rising demand, tight labor markets, supply chain interruptions and the recapture of energy prices from their pandemic lows. The oil price climbed to heights, which instigated growing worries amongst policymakers and analysts that it could steer to inflation expectancies becoming embedded in the wage and price setting procedure. The analysts at the Bank of America cautioned that oil could gush above $100 in the event of a cold winter and trigger inflation (Lee 2021). Similar interpretations have been articulated by many investment banks including Goldman Sachs, JP Morgan and Barclay, also the world's top asset manager BlackRock. Amplest of these reports are concentrated in the developed oil importing countries. Unlike oil-importing countries, the oil exporting nations stand to gain on all occasion oil prices are high. Inversely, low oil price could hurt the budget variables of such countries. In this paper, the impact of crude oil price on sectoral stocks indices in the Indian Stock Market is scrutinized with the help of sectoral stock indices of various companies as well as crude oil price.

Review of literature

The effects of oil price shocks on stock prices have been reviewed extensively by many scholars. The study on the empirical relationship between the crude oil & stock market is very inadequate in the present scenario. Most of the findings were focused on the impact of oil price movements on gross domestic product (GDP) (Hamilton, 1983; Hooker, 1999; Guo and Kliesen, 2005). Hamilton (1983) acknowledged a negative and significant relationship between oil price change and future GDP growth of the United States of America. Jones and Kabul (1996) displayed the negative feedback of US, Canadian, UK and Japan stock prices to oil price shocks by means of the impact of oil price shocks on real cash flows. Robert W. Faffa and Timothy J. Brailsford (1999) found that although long-term effects persist, some corporations have been able to hedge the risk. Imad A. Moosaa and Param Silvapulle (2000) analyzed on price–volume relationship in the crude oil futures market using linear and nonlinear causality testing.

Caner (2001) applied linear and nonlinear causality tests to examine the dynamic relationship between oil prices and stock markets, and concluded that a significant relationship between real stock returns and oil futures price is non-linear. Hammoudeh and Alias (2002) found that spill overs from oil markets to the stock indices of oil exporting countries, including Bahrain, Indonesia, Mexico and Venezuela. Syed A. Basher and Perry Sadorsky (2006) appraised the oil price risk impacts stock price returns in emerging markets by using Capital Asset Pricing Model. Irene Henriques and Perry Sadorsky (2007) studied about oil prices and the stock prices of alternative energy companies using 7 years data of Algeria, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, United Arab Emirates, and Venezuela. Blanchard and Gali (2007) portrayed the economic functioning of a set of industrialized economies in the repercussion of the oil price shocks of the 1970s and found a momentous role of oil prices in the economic downturns. Kilian (2008) concentrated on a number of issues, including in what way energy price shocks disturb the American markets. Dries prong et al. (2008) found out a strong relationship between stock market and oil market movements and explained that a shock to technology stock prices has a larger impact on alternative energy stock prices than a shock to oil prices has. J. Isaac Miller and Ronald A. Ratti (2008) conducted empirical research on Crude Oil and Stock Markets: Stability, Instability, and Bubbles taking 37 years data of Canada, France, Germany, Italy, U.K. and U.S stock market and found out an estimate of change in the relationship between real oil price and real stock prices in the last decade compared to earlier years, which may suggest the presence of numerous stock market bubbles and/or oil price bubbles. Chia-Lin Chang, Michael McAleer and Roengchai Tansuchat (2011) presented empirical research on Conditional Correlations and Volatility Spillovers between Crude Oil and Stock Index Returns taking 12 years data of Bahrain, Indonesia, Mexico and Venezuela. France, UK and Japan. (WTI and Brent markets, and the FTSE100, NYSE, Dow Jones and S&P 500stock index returns). Several evaluations have been conducted by Korhonen and Juurikkala (2009); Koranchelian (2005); Zalduendo (2006); Hanson et al. (1993); Adeniyi et al. (2012) to scrutinize the impact of oil price shocks on exchange rates. Maghyereh and Aktham (2004) observed that oil shocks have no noteworthy impact on stock index returns in emerging economies and the stock market returns in these economies do not realistically signal shocks in the crude oil market. Kilian Lutz and Park Cheolbeom (2007) exemplified the response of aggregate U.S. real stock returns may differ greatly depending on whether the upsurge in the price of crude oil is driven by demand or supply shocks in the crude oil market. Rong-Gang Cong, Yi-Ming Weia, and Jian-Lin Jiaoc, Ying Fana (2008) evaluated the relationships between oil price shocks and stock market by using VAR. Jose Alvarez-Ramirez, Jesus Alvarez and Eduardo Rodriguez (2008) surveyed the market and found that tending towards efficiency regime at long time horizons, outcomes do not exclude the possibility of market inadequacies at short time horizons. Nicholas Apergis and Stephen M. Miller (2008) exemplified the response of international stock market returns do not respond in a large way to oil market. Harri et al. (2009) explored the relationship between oil prices and primary commodity prices, besides exchange rates. Kalian and Park (2009) accounted that only oil price increases, determined by precautionary demand for oil over concern about future oil supplies, distress stock prices negatively. Babatunde Olatunji Odusami (2009) analyzed the empirical results obtained from the model found out that oil price shocks have significant nonlinear negative effect on aggregate stock return in the United States. Chaker Alouiand Rania Jammazi (2009) examined on the findings show that rises in oil price have a suggestive role in deciding both the volatility of stock returns and the probability of transition across regimes. Stavros Degiannakis, George Filis and Christos Floros (2009) observed that there is a dynamic correlation between stock market and oil prices. Syed Abul Basher and Alfred A. Haug and Perry Sadorsky (2011) found out the relationship between oil Prices, exchange rates and emerging markets equity prices. Nidhi Sharma and Kirti Khanna (2011) evaluated the Crude oil price velocity & stock market ripple taking 10 years data and consider New York Stock Exchange (NYSE), Bombay Stock Exchange (BSE) and London Stock Exchange (LSE) and found that there is no momentous impact of OPEC on stock market and other oil benchmarks. Yue-Jun Zhang and Yi-Ming Wei (2011) reviewed that the empirical results show that the overall shocks are noteworthy, and in the up (down) stock market a positive (negative) impact of oil price risk on stock returns was established. Amalendu Bhunia (2012) clarified the association between Crude Price and Stock Indices: take into account BSE relationships between BSE 500, BSE 200 and BSE 100. Nader Naifar and Mohammed Saleh Al Dohaiman (2013) assessed and found that the dependence structure between inflation rates and crude oil prices is asymmetric. Wensheng Kang and Ronald A. Ratti (2014) tested the impact of oil price shocks on the stock market return and volatility relationship. Hui- Ming Zhu, Rong Li and Sufang Li (2014) observed that the dependence between crude oil prices and Asia-Pacific stock market returns was usually weak, that it was positive before the global financial crisis. Jain & Patil (2015) opined that India must carefully plot the future petroleum requirements by practically sustaining rapid future economic growth. Rahma et al. (2016) explored the effect of oil price shocks on the main variables of Sudan's government budget and suggested that significant reduction in oil price influences oil revenues, current expenditure and budget deficit of Sudan.

Research Gap

Crude oil prices have enormous effects on the sectoral stocks in stock markets globally, which has been proved by various scholars in the past. But, a vast majority of these reviews were focused on western scenarios but with very scarce research in Indian settings. Studies have to be piloted in the direction of crude oil prices and sectoral stocks which may help to the investors, policymakers and the corporates in future. This study is an analysis of crude oil prices and stock indices in finding their relationship in the Indian Stock Market.

Variables	P-values
Banking Sector	0.326
FMCG	0.226
Metal Industry	0.147
Pharmaceutical	0.326
IT	0.147
Automobiles	0.440
Media	0.088
Financial Services	0.326

Scope of the study

Research about crude oil prices and sectoral stocks, their relationship and the outcome of stock price decisions will be very advantageous for investors, policymakers and the corporates in future. The study has made an overpowering contribution in the arena of the analysis of stock indices and crude oil prices in deciding future stock prices.

Statement of the problem

The unexpected crash in stock markets makes the investors disinclined to invest in stock markets though there are enormous gains from the stock markets. The hindrance for economic development is the cause behind the slothful performance. An appropriate study will provide prospective investors to formulate a germane decision to make investments The examination of what transpires in the stock market attributable to oil prices on sectoral indices is a development in the study which unknots the problem to a greater extent.

Objects of the Study

1. To study the effect of crude oil prices on sectoral indices in the Indian stock market
2. To analyze which sectoral index has a noteworthy effect when price of oil fluctuates

Hypothesis Testing and analysis

The stock price Indices from NIFTY and crude oil prices from 2014 to 2021(both years inclusive) were selected for the study. The null hypothesis(H0) is that no significant effect was found on sectoral stocks due to fluctuations in oil prices The alternate hypothesis (H1) is that significant effect was seen on sectoral stocks due to fluctuations in oil prices.
Data were scrutinized using Kendall's tau-b correlation using SPSS.
The analysis of Oil prices with Nifty Indices exposed that there is no statistical significance as the p-value obtained in all cases of indices are more than 0.05.

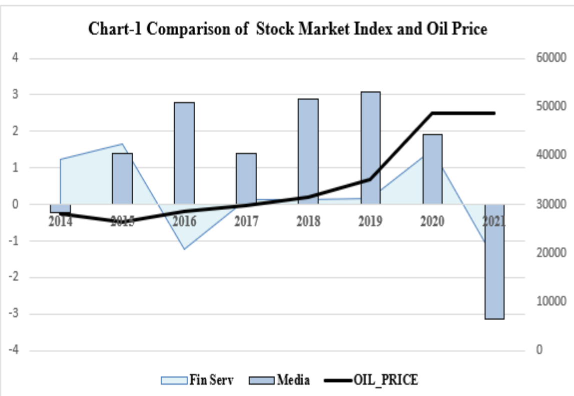


Chart-1 Comparison of Stock Market Index and Oil Price

The study about the relationship of oil price with the stock market index of financial services and media, the increase in oil prices (shown by frequency curve) have increased the index of media (shown by Bar diagram) during 2016, 2018 and 2019, but declined in 2020, may be because of the recession during the pandemic. The was a heavy decline during 2021. In the case of financial services (shown by area), there is increase in 2015 and 2020, but decline in 2016 and 2021 as depicted in Chart-1

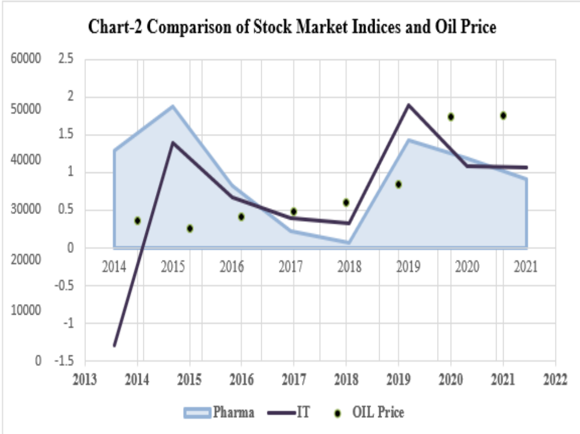


Chart-2 Comparison of Stock Market Indices and Oil Price

The study about the relationship of oil price with the stock market index of pharma and IT, the increase in oil prices (shown by dots) have increased the index of pharma (shown by area) during 2015 and 2019, but declined during 2016, 2017 and 2018. Then the index of pharma sector declined during 2020 and 2021. In the case of IT (shown by line), there is increase in 2015 and 2019, but declined in 2016 to 2018 and also during 2020 and 2021 as shown in Chart-2

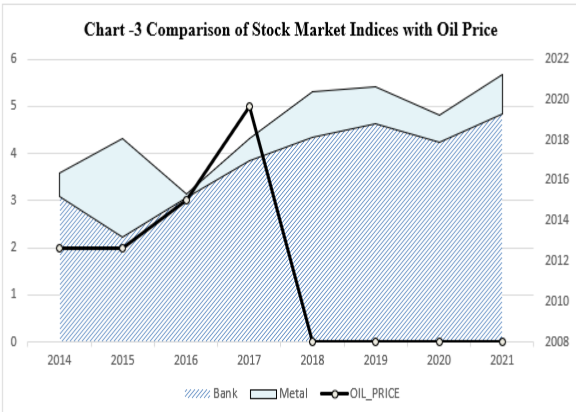
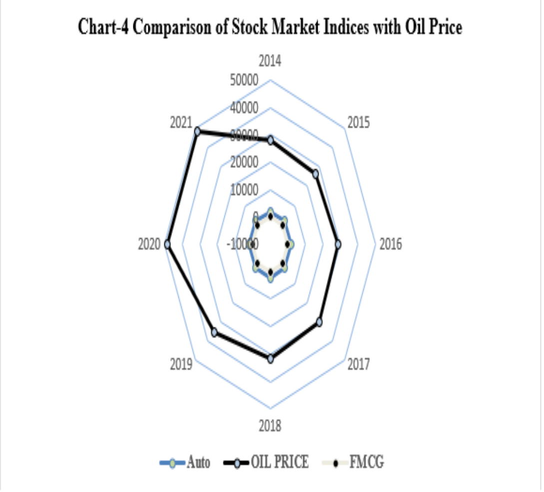


Chart -3 Comparison of Stock Market Indices with Oil Price

The study about the relationship of oil price with the stock market index of bank and metal, the increase in oil prices (shown by frequency curve) have increased the index of bank (shown by shaded area) from 2015 to 2019, but declined in 2020, may be because of the recession during the pandemic and then increased during 2021. In the case of metal (shown by area), there is increase in 2015, 2017,2018, 2019 and 2021 but declined during the remaining years as exhibited in Chart-3



The study about the relationship of oil price with the stock market index of automobiles and FMCG, the increase in oil prices (shown in black) have increased the index of automobiles (shown by blue circle) but steadily during these periods. In the case of FMCG (shown by dots), during 2015 and 2019 there is decline while during 2016, 2020 and 2021 there is increase as displayed in Chart-4

Conclusion

Fairly numerous studies by eminent scholars were aimed at finding the affinity between stock market indices and oil prices. The present study was aimed at finding the evaluation of association between market indices and oil prices. The study estimates the effect of oil prices and their effect on sectoral indices in the Indian stock market with the sustenance of data obtained from oilprice.com. The outcomes revealed that the fluctuations in oil prices affected the stock market indices of various sectors in different ways. In the case of stock market index of banks there is steady increase from 2015 onwards up to 2019, but declined in 2020 and then increased during 2021. The pandemic has affected the banking sector but the outcome was really reflected during 2021. In the case of metal industry there is high increase in 2015 and 2018 but in other years there showed a small increase due to variation in oil price.

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