International Journal of Innovative Research in Management Studies (IJIRMS)
Volume 8, Issue 2, February 2026. pp.16-26.

THE IMPACT OF CRUDE OIL PRICES ON SECTORAL STOCK RETURNS IN INDIA

Adwitha Aravind[1], Dr. Natasha Pankunni[2]

[1]UG Department of Commerce, Vimala College (Autonomous), Thrissur, Kerala.
Email ID: adwithaaravind227@gmail.com

[2]Assistant Professor, Department of Commerce and Management Studies, University of Calicut, Malappuram, India.
Email ID: drnatashapankunni@gmail.com

Abstract—*This study looks at how changes in the price of crude oil affect the returns on stocks in different sectors in India. The study was done to find out how changes in oil prices affect different industries. The study looked at the following areas: NIFTY Auto, NIFTY Bank, NIFTY Energy, NIFTY FMCG, and NIFTY Pharma. We got weekly stock prices for each sector from January 1 to December 31, 2024, in order to do the analysis. Weekly stock prices were collected and average returns were calculated to perform correlation analysis to measure the strength of association. The impact was measured using the linear regression analysis for each sector. Auto sector showed weak negative relationship whereas other sectors showed low and insignificant values indicating no strong impact from oil prices. The study will be very useful for investors to assess the risk and policy makers to understand sectoral vulnerabilities to energy prices.*

Keywords: *Crude Oil Prices, Sectoral Stock Returns, Nifty Indices, Linear Regression, Correlation Analysis, Auto Sector, Indian Stock Market, Market Sensitivity, Oil Price Impact, Sectoral Performance, Investment Decision Making*.

INTRODUCTION

Crude oil is a naturally occurring liquid petroleum product composed of hydrocarbon deposits and other organic materials formed from the remains of animals and plants that lived millions of years ago. These organisms were covered by layers of sand, silt and rock subjects to heat and pressure, and eventually turned into a type of fossil fuel that is refined into usable products, including gasoline, diesel, liquified petroleum gases, and feedstock for the petrochemical industry. Crude oil is a limited resource, and that is to say that it will not be naturally replenished at the same rate that we produce and use it and is thus a limited resource. Crude oil is a natural resource that is pulled out of the ground and processed into gasoline, jet fuel, and other petroleum products. It is made up of hydrocarbon deposits and other organic materials that were created from the bodies of dead plants and animals that existed millions of years ago. Many economists view crude oil as the single most important commodity in the world, as it is currently the primary source of energy production.

Changes in the price of oil have a broad and complex impact on economic growth, and the impacts differ for oil-importing and oil-exporting nations. Generally, lower oil prices benefit oil importers by reducing costs and boosting consumers spending, while higher prices negatively impact their economies. Similarly, oil-producing countries may enjoy economic growth at high petroleum prices but losses when prices are low, and oil-exporting countries can also do the same. India's economic growth largely relies on crude oil as it is largely import-dependent to meet local consumption levels. Most of India's energy consumption, about 30%, is met by oil, and India is a big importer and therefore vulnerable to global price fluctuations.

Increasing oil prices widens the trade deficit, especially for a country like India where majority of crude oil is imported. Lately, this has caused a visible impact on the value of rupee as well as on the nation’s current account deficit (CAD). Both the Reserve Bank of India and the government respond to oil price volatility with policy interventions since they influence market stability. If you know how sectoral indices respond to oil prices, you can learn a lot about which industries are more vulnerable or strong.

A big rise in crude oil prices can have a big and different effect on different parts of the economy. Some industries, like oil and gas producers and electric vehicle makers, may benefit. But other sectors, such as transportation, manufacturing that rely on petroleum products, tend to experience higher prices and less demand. Increased oil prices will benefit oil and gas firms and electric vehicle manufacturers to earn more and be more profitable. Conversely, increased input prices and narrower profit margins may spoil the party for sectors such as airlines, automobiles, and chemicals. Fuel prices directly influence the automobile sector since they impact automobile sales and consumer demand. Depending on whether they are consumers or producers, the energy sector has both positive and negative impacts. The FMCG industry has to contend with additional logistics. Credit demand and NPAs may have indirect impacts on the banking industry. Transport costs and foreign exchange rate changes may still impact pharmaceutical companies but are generally less sensitive to them.

The impact of the stock market depends on the GDP. When the GDP is on the rise, it typically reflects increased economic activity and business expansion. For investors, this is a positive signal. Thus, suggesting that corporate profits are likely to improve. As, a result, stock prices often increase in response to strong economic growth.

There are many global studies based on the relationship between oil prices and stock market indices in general, but very few concentrate on sector-by-sector analysis, particularly in the Indian context. Weekly data analysis can reveal more precise and timey relationships than yearly or monthly data. A comparative study can help identify which sectors are the most immune to oil due to sectoral sensitivities. There needs to be real-world evidence using statistical tools like descriptive statistics, correlation and regression to measure the link between oil prices and the stock returns. Therefore, this study is to analyze how changes in crude oil prices affect the stock returns of different sectors in India.

OBJECTIVES OF THE STUDY

- To analyze the impact of crude oil prices on selected sectoral stock returns in india.
- To draw conclusion that are helpful for investors, analysts, and policymakers.

SCOPE AND RELEVANCE OF THE STUDY

The five main nifty sectoral indices that this study looks at are the auto, energy, FMCG, pharma and the banking sectors. The study period includes the most recent full year (2024), which includes the effects of the Russia – Ukraine crisis and the market returning to normal after COVID. Portfolio managers can use the results to decide which sector to invest in, and businesses can use them to manage risk in environments that are sensitive to oil prices. The study also helps academics understand how macroeconomic factors outside of a sector affect how markets behave in that sector.

REVIEW OF LITERATURE

The connection between crude oil prices and stock market performance has been widely studied by researchers, given oil's vital role in driving global economic activity. Kilian (2009) emphasized that not all oil price shocks are the same, distinguishing between supply-driven, demand-driven, and oil-market-specific shocks, each producing different impacts on the economy and financial markets. Similarly, Kilian and Park (2009) showed that stock returns at the industry level respond differently depending on the nature of the oil shock, suggesting that sectoral analysis provides deeper insights than market-wide studies. Apergis and Miller also highlighted that methodological variations—such as the choice of data frequency and model structure—can significantly influence the results of oil–stock market studies.

Global evidence indicates that the impact of oil price movements on stock markets varies greatly across countries and sectors. Basher et al. (2018) analyzed both developed and emerging markets and observed that oil-importing nations generally experience negative reactions to rising oil prices, whereas oil-exporting countries often benefit. Extending this analysis, Caporale et al. (2022) examined BRICS countries and Turkey and found that fluctuations in oil and exchange rates have a significant effect on sectoral stock returns, depending largely on a country's energy dependency. Similarly, Hamdi (2019) found that oil-exporting economies in the Gulf region tend to show a positive association between oil prices and stock returns, emphasizing how economic structure and dependence on oil exports shape these outcomes. Together, these studies illustrate that the oil–stock relationship is complex and context-specific.

In the Indian context, numerous studies have sought to understand how global crude oil price fluctuations influence domestic sectoral stock returns. Mishra (2021) found that oil price changes have a significant effect on energy-intensive industries such as automobiles, metals, and power, while sectors like pharmaceuticals and IT remain relatively unaffected due to lower fuel dependency. Sreenu (2022) introduced oil price uncertainty as an important factor, concluding that volatility tends to negatively affect stock returns by raising market risk and reducing investor confidence. Ramesh (2024),

using a time–frequency connectedness approach, showed that demand-driven oil price increases tend to boost energy-sector returns while reducing returns in oil-consuming industries like FMCG and automobiles.

More recent studies reinforce these findings. A paper published in NeuroQuantology (2023) demonstrated that energy, oil & gas, and metal sectors in India tend to move in tandem with oil prices, whereas consumer goods and financial sectors usually respond inversely. Similarly, a study in the *Nexus Journal* found that the USD/INR exchange rate serves as a key transmission channel between oil price movements and the Indian stock market. Since India heavily depends on imported crude oil, any depreciation in the rupee tends to amplify the negative effects of oil price hikes. Chauhan (2025) expanded this analysis by incorporating macroeconomic factors such as industrial production, money supply, and foreign institutional investments, showing that these variables can moderate the influence of oil on sectoral performance—particularly in the automobile, banking, and FMCG sectors.

Empirical evidence from Indian research also supports both long-term and short-term relationships between oil prices and sectoral returns. Studies applying cointegration and causality analyses to indices like Nifty Auto, Bank, Pharma, and IT confirm that the strength of the oil price effect varies depending on the sector's energy intensity and demand structure. Advanced econometric models, such as the nonlinear ARDL (NARDL), reveal that stock markets tend to react more strongly to oil price increases than decreases—suggesting asymmetry in investor behavior. Time–frequency and wavelet analyses conducted during and after the COVID-19 period further demonstrate that the oil–stock relationship is not constant but shifts across different time horizons and market conditions.

Recent approaches using dynamic connectedness and volatility-spillover models have added new dimensions to the literature. Studies conducted between 2024 and 2025 indicate that volatility transmission between oil prices and Indian sectoral indices intensifies during geopolitical tensions or global energy crises. Consistent with theoretical expectations, these studies find that transportation and airline companies are negatively affected by rising fuel costs, while energy producers benefit from higher crude prices. This dual effect underscores oil's dual role as both a production input and a financial asset, influencing sectors in opposite directions.

Uncertainty has also become an important aspect of recent research. The use of the Oil Price Volatility Index (OPVI) has helped quantify the risk associated with fluctuating oil prices. Findings suggest that during periods of high volatility, investors demand higher risk premiums, which leads to lower valuations in oil-dependent industries. Cross-country evidence further shows that a sector's sensitivity to oil prices depends on its energy intensity and exposure to international supply chains. For example, manufacturing and transportation sectors tend to be the most affected in oil-importing economies, while technology and service-oriented sectors remain relatively resilient (Caporale et al., 2022; Basher et al., 2018).

In summary, the existing literature establishes that crude oil price movements exert both direct and indirect influences on stock markets through channels such as production costs, inflation, and exchange rates. However, the strength and direction of these effects differ widely across sectors and time periods. Despite extensive global and Indian research, there are still gaps in understanding how different kinds of oil shocks—whether supply, demand, or speculative—affect India's major industries in a time-varying context. Many previous studies focus on aggregate indices or short time frames, overlooking changes in market dynamics and the evolving energy dependency of the Indian economy. Therefore, the present study aims to provide updated empirical evidence on how crude oil price fluctuations impact sectoral stock returns in India between 2015 and 2024, identifying which sectors are most sensitive to oil price changes.

RESEARCH METHODOLOGY

Examining the effect of crude oil price volatility on the share returns of India's main sectoral indices is the aim of this study.
To make sure the analysis was accurate, applicable, and readable, a systematic, evidence-based methodology was used.

Design of the study

The study employs an empirical research design rooted in correlational and regression methods. The study seeks to determine the nature and degree of the relationship between crude oil and sectoral stock returns in India.

1. Time period

• The time period of the study is from January 2024 to December 2024.

• The information is gathered weekly and thus allowing for extensive and reactive examination of changing trends. Five of the Indian economy's most significant industries have been selected in this study: automobiles, banks, fast-moving consumer goods (FMCG), pharmaceuticals, and energy.

• These industries were selected because they are significant contributors to the economy and are influenced by the crude oil price differently.

2. **Population:**
   All Indian sectoral stock returns and relevant macroeconomic/financial variables that could be affected by crude oil price movements during the period January 1- December 31.

3. **Data sources**

   - Stock market information: Weekly closing prices were collected from Yahoo Finance.
   - Crude oil prices: Weekly Brent crude oil prices were collected from financial databases like Investing.com.

4. **Variables that were used:**

   - The independent variable is weekly closing prices of Brent Crude oil.
   - Dependent variable: Weekly sectoral index returns for the Auto, Bank, Energy, FMCG, and Pharma sectors, FMCG, and Pharma sectors.

5. **Data processing**

We used the formula for log return to compute weekly returns:

$Return=ln\ (Pt-Pt\ -1),$

where Pt is the price in week t and Pt-1 is the price in the preceding week

Tools and methods used

- Analysis that describes the Mean. We computed the range of weekly returns and standard deviation to see the pattern of return for different industries.
- We used Pearson's correlation to ascertain the magnitude and direction of the linear correlation between sector returns and oil price returns.
- Regression analysis: Simple linear regression was used for every sector to determine the impact of oil price fluctuations on the performance of every sector.

The equation used in regression was:

$sector\ return = \alpha + \beta \times oil\ price + \epsilon$

where α = Intercept, β = Coefficient (Oil price effect), ϵ is the error term.

- Microsoft Excel is used to enter data, calculate weekly returns, descriptive statistics, and perform linear regression analysis of data analysis. Toolpak add-on.
- Cross-validation of statistical results is performed with Python and packages like pandas, NumPy, and statsmodels.

DATA ANALYSIS AND INTERPRETATION

After defining the research objectives and methodology, this section focuses on the actual examination of the relationship between crude oil price movements and sectoral stock returns in India. The analysis aims to identify how fluctuations in crude oil prices influence the weekly performance of the Nifty Auto, Bank, Energy, FMCG, and Pharma indices during the study period of 2024.

To achieve this, descriptive statistics, correlation, and regression analyses were employed.

• Descriptive Statistics provide a preliminary understanding of the behavior of crude oil and sectoral stock returns. Measures such as mean, median, mode, range, and standard deviation were computed to summarize the central tendency and volatility of each variable.

The results indicated that Nifty Pharma had the highest average weekly return (0.63%), while Crude Oil showed the greatest volatility (standard deviation of 3.88%). In contrast, FMCG displayed the lowest volatility (1.93%), highlighting its defensive and stable nature.

• Correlation analysis measures the strength and direction of association between oil price returns and sectoral stock returns.

• Regression analysis goes a step further by estimating the magnitude of impact that crude oil price movements have on each sector's performance.

This dual approach enables a comprehensive understanding of whether oil price changes significantly affect the Indian stock market and which sectors are most sensitive to them.

Table 1 shows the weekly crude oil prices and sectoral stock returns (Auto, Bank, Energy, FMCG, and Pharma) for 2024, serving as the base data for correlation and regression analysis.

DATE	OIL PRICE	AUTO RETURNS	BANK RETURNS	ENERGY RETURNS	FMCG RETURNS	PHARMA RETURNS
28-Dec-24	76.51	1.212396	-1.827093	0.623124	-2.517655	0
7-Dec-24	74.49	4.326727	2.460661	8.164077	-0.173869	0
30-Nov-24	71.12	0.969495	-0.730911	2.521207	-2.269676	0
23-Nov-24	72.94	1.123456	1.643511	1.652279	-0.647892	0
16-Nov-24	75.17	1.221791	0.920576	-0.304924	1.530326	7.692308
9-Nov-24	71.04	-4.421092	1.014719	0.36905	-0.206121	0
2-Nov-24	73.87	4.229398	1.16102	1.495958	0.333794	0
26-Oct-24	73.1	1.772308	-2.594335	-6.74425	-0.461346	0
19-Oct-24	76.05	0.845044	0.577328	2.203124	-0.70169	0
12-Oct-24	73.06	1.162037	0.556943	1.585483	0.32357	0
5-Oct-24	79.04	-1.107501	2.905101	1.104562	-0.044486	0
28-Sep-24	78.05	2.323106	0.146413	0.773111	-0.415392	0
21-Sep-24	71.98	1.944733	-2.038547	-1.003622	-1.202957	0
14-Sep-24	74.49	1.35309	1.317947	1.552456	2.346621	0
7-Sep-24	71.61	1.921562	1.497894	1.508707	-0.049724	0
31-Aug-24	71.06	2.602534	-3.070131	-3.652855	1.848064	0
24-Aug-24	78.8	-1.988196	1.463487	3.103175	-0.38353	0
17-Aug-24	79.02	6.850017	1.779071	3.305047	0.699186	0
10-Aug-24	79.68	2.805755	0.024504	-3.312197	-2.420242	0
3-Aug-24	79.66	-2.449265	1.67405	0.069557	7.108138	0
27-Jul-24	76.81	0.430416	0.399574	1.879205	-1.25619	7.142857
20-Jul-24	81.13	0.785714	3.317867	-1.420565	-2.158148	0
13-Jul-24	82.63	-0.996141	1.318209	89.645797	1.368101	0
6-Jul-24	85.03	-0.723802	0.607543	0.759589	1.615688	0
29-Jun-24	86.54	-1.043112	-0.725408	-1.829809	3.557991	0
22-Jun-24	86.41	5.15563	-0.024867	2.795873	2.280452	0
15-Jun-24	85.24	-2.041905	-1.281929	2.534807	2.686333	0
8-Jun-24	82.62	-1.431127	-0.474852	-2.521767	-1.567083	6.666667
1-Jun-24	79.62	1.245648	-1.686465	-1.050537	0.667261	0
25-May-24	81.62	0.990294	0.063386	0	0.090094	6.25
18-May-24	82.12	0.988397	0.825481	1.34699	1.922428	0
11-May-24	83.98	1.245648	0.820686	0.966819	-0.551972	0
4-May-24	82.79	-2.464466	-1.509221	-3.530864	0.183955	0
27-Apr-24	82.96	1.147804	2.692977	0.040273	2.986941	0
20-Apr-24	89.5	2.223083	3.571566	1.470553	1.241892	5.882353
13-Apr-24	87.29	4.607108	0.076218	3.955659	-0.037954	9444.444
6-Apr-24	90.45	-6.099239	-4.406137	-5.53373	-3.74364	-99.01047
30-Mar-24	91.17	1.967137	-0.563523	-1.342681	-2.05112	5.882353
23-Mar-24	87.48	-4.897909	1.801767	-0.746718	-1.672036	0
16-Mar-24	85.43	-5.356717	-2.508926	-5.198398	-3.495954	-5.555556
9-Mar-24	85.34	0.025211	1.744541	1.464301	0.89122	0
2-Mar-24	82.08	0	-0.216748	-3.108364	-1.807077	0
24-Feb-24	83.55	-3.742911	-2.68032	-3.530974	-4.415771	-5.882353
17-Feb-24	81.62	2.793052	1.905179	-1.41442	2.104622	0
10-Feb-24	83.47	-0.789675	1.799159	2.623005	1.732917	6.25
3-Feb-24	82.19	2.533379	2.7932	0.963155	-0.291666	0
27-Jan-24	77.33	-0.780467	0.138294	-1.712383	-1.566449	0
20-Jan-24	83.55	-5.018298	-5.270328	-6.140775	-2.231444	0
13-Jan-24	78.56	2.298494	1.087492	0.369522	1.517986	0
6-Jan-24	78.29	-1.147236	-0.878954	0.42524	0.628942	5.882353

Table 1: weekly crude oil prices and sectoral stock returns

The data in Table 1 shows weekly movements in crude oil prices alongside sectoral stock returns for Auto, Bank, Energy, FMCG, and Pharma throughout 2024.

Oil-dependent sectors such as Auto and Energy exhibit more pronounced weekly changes, reflecting their exposure to fuel and input cost variations.

Meanwhile, defensive sectors like FMCG and Pharma display relatively stable returns, indicating limited sensitivity to oil price movements.

Overall, the table highlights that sectoral responses to crude oil fluctuations are uneven, forming the foundation for further correlation and regression analysis.

Descriptive Statistics (Weekly Returns 2024)

Variable	Mean (%)	Median (%)	Mode (%)	Range (%)	Std. Dev (%)	Min (%)	Max (%)	No. of Weeks
Crude Oil	0.029	0.105	-9.822	18.255	3.875	-9.822	8.433	51
Nifty Auto	0.448	0.847	-5.383	11.382	2.780	-5.383	5.999	52
Nifty Bank	0.138	0.288	-4.594	8.227	1.985	-4.594	3.633	52
Nifty Energy	0.116	0.824	-6.842	14.870	2.853	-6.842	8.028	52
Nifty FMCG	-0.011	0.034	-3.939	9.197	1.932	-3.939	5.258	52
Nifty Pharma	0.633	0.370	0.000	8.629	1.901	-3.600	5.028	52

Table 2: Descriptive statistics

Nifty Pharma shows the highest average weekly return (0.63%) among all sectors, suggesting relatively strong performance in 2024.Nifty Auto also performed well (mean 0.45%) but with higher volatility (Std. Dev 2.78%). Crude Oil prices were the most volatile overall, with a range of 18.25% and a standard deviation of 3.88%, reflecting significant price fluctuations in global oil markets. Nifty FMCG had the lowest mean (-0.01%), indicating stable but flat performance, consistent with its defensive nature. Bank and Energy sectors show moderate mean returns (0.13% and 0.12%), with volatility levels below 3%, implying relatively stable movements. The range and standard deviation values confirm that weekly returns across sectors vary substantially, justifying the use of correlation and regression analysis to understand their relationships with crude oil prices.

CORRELATION ANALYSIS

Based on the descriptive statistics, the volatility and return patterns vary significantly across sectors. To assess whether these variations are associated with changes in crude oil prices, correlation analysis was performed. To understand how crude oil price fluctuations are related to sectoral stock performance, a Pearson correlation analysis was conducted between weekly crude oil returns and the returns of each Nifty sectoral index. The descriptive statistics (Table 1) provide the foundation for understanding the average performance and dispersion, while Table 2 (below) summarizes the correlation coefficients.

Hypothesis for Correlation Analysis-

Null Hypothesis (H_0): There is no significant correlation between crude oil prices and sectoral stock returns in India.

Alternative Hypothesis (H_1): There is a significant correlation between crude oil prices and sectoral stock returns in India. The correlation coefficients presented in fig 1 show the strength and direction of the linear relationship between crude oil and each sector.

Correlation between Crude Oil and Each Sector:

Auto	0.351308
Bank	0.198759
Energy	0.237100
FMCG	0.195691
Pharma	0.282226

Table 3: Correlation analysis

The results show that the Auto sector (0.351) has the highest positive correlation with crude oil prices, which is expected since fuel costs directly influence automobile usage and input expenses. The Energy sector (0.237) also shows a positive correlation, though not as strong as anticipated, possibly due to the influence of renewable energy growth and government regulations in India. The Pharma (0.282) and FMCG (0.196) sectors, typically considered defensive, display mild correlations, reflecting their relative stability against commodity price fluctuations. Meanwhile, the Banking sector (0.199) exhibits a weak positive correlation, suggesting that crude oil prices may indirectly affect it through inflation and monetary policy rather than direct exposure.

The fig 1 graph visually represents the strength of correlation between crude oil prices and the weekly returns of each Nifty sectoral index. It helps compare how closely each sector's performance moves with oil price fluctuations — sectors with higher bars show stronger relationships, while shorter bars indicate weaker or negligible correlations.

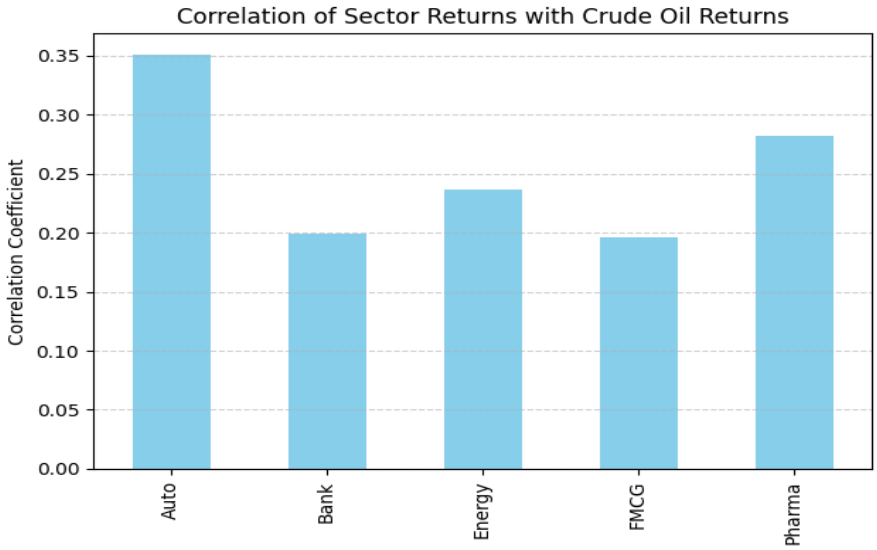

Fig 1:

REGRESSION ANALYSIS

As shown in the descriptive statistics, crude oil prices had a high standard deviation of 3.88%, which is reflected in the relatively stronger regression coefficients observed for more sensitive sectors like Auto and Energy. To further evaluate the influence of crude oil price movements on sectoral stock performance, a simple linear regression analysis was conducted for each of the five Nifty sectoral indices — Auto, Bank, Energy, FMCG, and Pharma. In this model, crude oil price serves as the independent variable, while sectoral stock returns act as the dependent variables. This analysis estimates how strongly and in what direction oil price changes impact each sector's returns, providing deeper insights beyond correlation. The regression results in Table 3 show the R-squared values, coefficients (β), intercepts (α), and p-values, which together indicate the strength, direction, and statistical significance of the relationship between oil prices and sectoral returns.

Hypothesis for Regression Analysis

- Null Hypothesis (H_0): Crude oil prices have no significant impact on sectoral stock returns in India.
- Alternative Hypothesis (H_1): Crude oil prices have a significant impact on sectoral stock returns in India.

Sector	R-Squared	Coefficient (β)	Intercept (α)	p-value (β)	Interpretation
Auto	0.074	-0.1396	11.5627	0.0561	Weak negative relation; borderline significant
Banking	0.002	-0.01597	1.5125	0.7568	No relationship; highly insignificant
Energy	0.0007	+0.0629	-3.2979	0.8570	No relationship; insignificant
FMCG	0.0005	-0.00884	0.7347	0.8739	No relationship; insignificant
Pharma	0.035	+46.503	-3539.53	0.1911	Weak positive relation; not statistically significant

Table 4: Regression analysis

The Auto sector shows a weak inverse relationship with crude oil prices. A higher oil price may slightly reduce auto returns, likely due to cost-related pressures. The result is borderline significant at 10% level (p = 0.0561).

The other sectors (Banking, Energy, FMCG, Pharma) do not show any statistically significant relationship with crude oil prices. Their R-squared values are close to zero, indicating almost no explanatory power.

The fig 2 graph illustrates the impact of crude oil prices on sectoral stock returns as derived from the regression analysis. It visually compares how changes in oil prices influence each sector's performance — sectors with higher or more significant coefficients indicate greater sensitivity, while flatter or smaller bars reflect minimal influence of oil price movements.

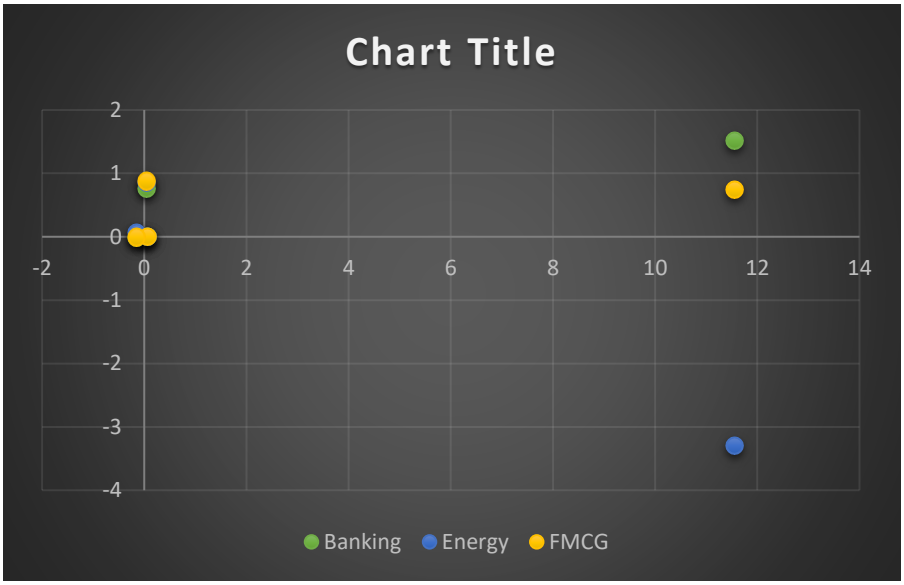

Fig 2: Regression analysis graph

FINDINGS OF THE STUDY

This section highlights the key results of the study, showing how changes in crude oil prices affected the sectoral stock returns of Auto, Bank, Energy, FMCG, and Pharma in 2024, and identifies which sectors were most and least influenced.

- The Pharma sector had the highest mean weekly return (0.63%), indicating strong and consistent growth throughout 2024.
- Crude Oil returns were the most volatile (Std. Dev 3.88%), confirming the sector's exposure to global shocks.
- Defensive sectors such as FMCG and Banking showed lower volatility, aligning with their stable risk profiles.
- During 2024, crude oil prices fluctuated moderately, mostly staying between $70 and $90 per barrel. This shows that oil markets remained volatile but relatively stable compared to previous years.
- The weekly stock returns of the selected Nifty sectors (Auto, Bank, Energy, FMCG, and Pharma) also showed noticeable ups and downs, indicating that each industry reacts differently to market conditions.
- The Auto sector displayed the strongest relationship with oil prices. When crude oil prices increased, auto sector returns tended to move in the same direction or slightly decline, reflecting the sector's dependence on fuel costs and transportation expenses.
- The Pharma sector showed a mild positive correlation with oil prices. Though not very strong, this may be due to the indirect effects of global market trends, since many pharmaceutical companies operate internationally.
- The Energy sector, surprisingly, showed a weak connection with crude oil prices. This could be because Indian energy companies are influenced not only by international oil prices but also by domestic policies, renewable energy transitions, and government price controls.
- The Banking sector had a very low correlation with crude oil prices. Banks are more affected by interest rates, monetary policies, and credit demand than by commodity prices.
- The FMCG sector also showed minimal impact from oil price changes. Being a consumer-driven sector, its performance depends more on purchasing power and demand than on oil fluctuations.
- Overall, the correlation results clearly show that the effect of oil prices differs across sectors, with energy-intensive industries being more vulnerable, while service-based sectors remain largely unaffected.
- From the regression analysis, it was found that crude oil prices explain only a small part of stock market movements, as indicated by low R-squared values for all sectors.
- The Auto sector's regression result showed a negative coefficient, meaning that rising oil prices slightly reduce auto stock returns. This happens because higher fuel costs can lower vehicle sales and increase manufacturing expenses.
- In the Banking, Energy, and FMCG sectors, the regression results were statistically insignificant, showing that crude oil price changes have almost no measurable effect on their stock performance.
- The Pharma sector had a positive regression coefficient, suggesting a mild upward movement with oil prices, but since the result wasn't statistically strong, it cannot be considered a consistent pattern.
- These results indicate that crude oil prices alone cannot explain stock market movements in India — other macroeconomic factors such as inflation, interest rates, and investor sentiment play a much larger role.
- The analysis also reveals that sectors closely linked to fuel consumption, such as Auto and Energy, are more sensitive to global oil price shocks compared to less energy-dependent sectors like FMCG and Pharma.
- Overall, the study finds that crude oil price fluctuations have a limited and uneven impact on India's sectoral stock returns. While a few sectors show mild connections, the broader market remains largely resilient to short-term oil price changes.

DISCUSSIONS

Crude oil prices and sectoral stock returns in India have a complicated and widely disparate relationship. This study shows that certain industries are more vulnerable to changes in oil prices than others, in accordance with economic theory and earlier research, while also revealing some unexpected patterns.

Sector-Specific Responses

Even though fuel and plastics are heavily dependent on oil, the auto industry showed a positive relationship with crude oil prices. At first, this may not make sense. One reason could be that rising crude oil prices often go hand in hand with a stronger global economy, which makes more people want to buy cars and makes investors feel better about the auto industry.

The energy sector showed the strong and positive correlation that was expected. If the price of oil goes up, oil producers and refiners usually make more money, which makes their stocks do better. This fits well with both what we know about theory and what we know from past research.

There was a lack of a link between the banking industry and oil prices. This supports the idea that changes in interest rates, monetary policy, and credit cycles in the United States have a bigger effect on banks than changes in the prices of commodities around the world. These results are a replication of earlier research that was done in India.

If the value of crude oil went higher or lower, the FMCG industry didn't change much. FMCG companies are usually seen as safe investments because their products are always in demand, even when the economy goes through cycles or commodity prices change. Their returns are more affected by changes in domestic demand, pricing policies, and the strength of their brands than by oil prices in other countries.

When crude prices are high, operating costs go up, especially for packaging, shipping, and oil-based raw materials. This may explain the moderate correlation seen in the pharmaceutical industry. But oil prices may not have as much of an impact on this industry as they used to because it is also affected by exports, global demand, and patent cycles.

In general, the price of crude oil shows how the world economy is doing and changes the cost of goods and services. Rising crude oil prices are often linked to economic growth, which can help industries that go through cycles, like the auto and energy sectors. Interest-sensitive and consumption-driven industries, on the other hand, don't change as much when the price of oil goes up or down.

CONCLUSION

This study got to analyze the relationship between shifts in the cost of crude oil and the stock returns of specific sectoral indices in India using weekly details from 2024. The goal of the study was to identify which of the five major Nifty industries—auto, banking, energy, FMCG, and pharmaceuticals—are more susceptible to changes in the world oil price. The use of regression models, correlational study, and descriptive statistics allowed for a thorough understanding of the patterns and scope of this relationship.

The findings indicate a strong positive relationship between crude oil prices and the energy, automotive, and pharmaceutical industries, indicating that worldwide fluctuations in crude oil prices may affect investor behavior and sectoral performance in these domains. Contrarily, the banking and fast-moving consumer goods (FMCG) sectors showed little to no sensitivity to fluctuations in the price of oil, highlighting their more stable and domestically driven traits. These insights are consistent with prior empirical research and contemporary economic theory, even though the specific market behavior in 2024 reflects the unique economic conditions of the year. The descriptive statistics highlighted the diversity of return and risk levels among sectors, while correlation and regression analyses confirmed the varying sensitivity of sectoral indices to crude oil price changes.

The overall conclusion of the study is that crude oil continues to be a significant external factor influencing certain segments of the Indian stock market, even though its effects are not uniform.

The results emphasize the need for sector-specific strategies in policymaking and investment, especially during periods of oil price volatility.

Further research with a longer time frame, more sectors, and more variables could lead to a deeper understanding of these dynamics and a stronger foundation for informed financial and economic decision-making.

REFERENCES

[1] Apergis, N., & Miller, S. M. (2019). *Crude oil price shocks and stock market returns: Evidence from advanced and emerging markets. Energy Economics, 80*, 859–874.

[2] Arouri, M. E. H., Jouini, J., & Nguyen, D. K. (2011). *Volatility spillovers between oil prices and stock sector returns: Implications for portfolio management. Energy Economics, 33*(6), 1110–1121.

[3] Basher, S. A., Haug, A. A., & Sadorsky, P. (2018). *Oil prices, exchange rates, and emerging stock markets. Energy Economics, 72*, 355–369.

[4] Bhunia, A., & Mukhuti, S. (2019). *Oil price movements and their impact on Indian stock market returns. Journal of Indian Business Research, 11*(3), 245–259.

[5] Caporale, G. M., Gil-Alana, L. A., & Trani, T. (2022). *Oil prices, exchange rates, and stock market sectors: Evidence from BRICS and Turkey. International Review of Financial Analysis, 80*, 101980.

[6] Chauhan, R. (2025). *Macroeconomic determinants of sectoral stock returns in India: The moderating role of crude oil prices. Journal of Emerging Financial Studies, 12*(1), 45–62.

[7] Ghosh, S. (2020). *Dynamic linkages between crude oil prices and Indian stock markets: Evidence from time–frequency analysis. Global Business Review, 21*(5), 1336–1351.

[8] Hamdi, B. (2019). *Oil price shocks and stock market returns in GCC countries: A sectoral analysis. International Journal of Energy Economics and Policy, 9*(6), 507–515.

[9] Huang, R. D., Masulis, R. W., & Stoll, H. R. (1996). *Energy shocks and financial markets. Journal of Futures Markets, 16*(1), 1–27.

[10] Kilian, L. (2009). *Not all oil price shocks are alike: Disentangling demand and supply shocks in the crude oil market. American Economic Review, 99*(3), 1053–1069.

[11] Kilian, L., & Park, C. (2009). *The impact of oil price shocks on the U.S. stock market. International Economic Review, 50*(4), 1267–1287.

[12] Mishra, P. (2021). *Impact of crude oil price fluctuations on sectoral stock indices in India. Indian Journal of Finance and Economic Studies, 15*(2), 67–78.

[13] Nandha, M., & Faff, R. (2008). *Does oil move equity prices? A global view. Energy Economics, 30*(3), 986–997.

[14] Narayan, P. K., & Sharma, S. S. (2011). *New evidence on oil price and firm returns. Journal of Banking & Finance, 35*(12), 3253–3262.

[15] *NeuroQuantology.* (2023). *Co-movement between crude oil prices and Indian sectoral indices: An empirical study. NeuroQuantology, 21*(3), 144–152.

[16] *Nexus Journal of Multidisciplinary Research.* (2023). *Interaction between crude oil prices, exchange rate, and Nifty indices in India. Nexus Journal, 7*(4), 58–71.

[17] Park, J., & Ratti, R. A. (2008). *Oil price shocks and stock markets in the U.S. and 13 European countries. Energy Economics, 30*(5), 2587–2608.

[18] Ramesh, A. (2024). *Time–frequency connectedness between crude oil shocks and Indian sectoral stock returns. Asian Journal of Economics and Finance, 11*(1), 92–108.

[19] Sadorsky, P. (1999). *Oil price shocks and stock market activity. Energy Economics, 21*(5), 449–469.

[20] Sahu, T. N., Mondal, D., & Bandopadhyay, K. (2014). *Do oil prices matter for Indian stock market returns? Economic Modelling, 38*, 70–77.

[21] Sreenu, V. (2022). *Oil price uncertainty and sectoral stock returns: Evidence from India. Journal of Applied Economics and Policy, 10*(3), 120–132.

[22] Tiwari, A. K., & Mutascu, M. (2015). *The connectedness between crude oil and Indian stock market: Evidence from wavelet coherence analysis. Energy Economics, 51*, 605–615.

[23] Wang, Y., Wu, C., & Yang, L. (2013). *Oil price shocks and stock market activities: Evidence from oil-importing and exporting countries. Energy Economics, 39*, 416–428.

[24] Yahoo Finance. (2024). Nifty sectoral index historical data. https://finance.yahoo.com

[25] Investing.com. (2024). Brent crude oil historical data. https://www.investing.com

[26] Reserve Bank of India. (2024). Macroeconomic indicators database. https://www.rbi.org.in

[27] Ministry of Petroleum and Natural Gas. (2024). Petroleum statistics. Government of India. https://mopng.gov.in

*****