

Oil Price Shock and Equity Market Response: Evidence from Indian Indices during Iran War

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ABSTRACT

The study examines the impact of Iran war-induced crude oil price shocks on the Indian stock market. Using time-series data and econometric techniques such as ADF, regression, GARCH, and event study analysis, the study evaluates the relationship between oil prices, stock returns, exchange rate, inflation, and capital flows. The findings reveal that rising crude oil prices negatively affect stock market performance and increase market volatility during periods of geopolitical uncertainty. The study highlights the vulnerability of the Indian economy to external oil shocks due to its heavy dependence on crude oil imports.

Keywords: Crude Oil Prices, Iran War, Stock Market Returns, Market Volatility, Exchange Rate, Inflation, Capital Flows, GARCH Model, Event Study, Indian Stock Market.

INTRODUCTION

Geopolitical conflicts have historically served as significant exogenous shocks to global financial markets, particularly through their impact on energy prices. The ongoing conflict involving Iran has once again underscored the sensitivity of crude oil markets to geopolitical instability. Disruptions in supply chains especially through strategically critical routes such as the Strait of Hormuz have triggered sharp increases in global crude oil prices, introducing heightened uncertainty into international economic systems. Given that crude oil remains a fundamental input in production, transportation, and industrial processes, such price shocks tend to propagate rapidly across both developed and emerging economies.

India, as the world's third-largest consumer and importer of crude oil, is particularly vulnerable to such external disturbances. The country imports approximately 85–90% of its crude oil requirements, rendering its macroeconomic stability highly sensitive to fluctuations in global oil prices. A sustained rise in crude prices significantly increases the import bill, widens the current account deficit, and exerts pressure on fiscal balances. Moreover, elevated oil prices transmit directly into domestic inflation through higher fuel costs and input prices, thereby influencing inflation expectations and monetary policy responses.

The transmission of oil price shocks to the Indian stock market operates through multiple interrelated channels. First, rising crude prices elevate inflation expectations, which may prompt tighter monetary policy, higher interest rates, and reduced corporate profitability factors that negatively affect equity valuations. Second, higher import costs increase demand for foreign currency, leading to depreciation of the Indian rupee. Recent evidence indicates that the Iran conflict has contributed to notable currency weakness, reflecting the pressure exerted by elevated oil prices and external imbalances. Third, heightened geopolitical risk often triggers a “risk-off” sentiment among global investors, resulting in foreign capital outflows from emerging markets like India. Such outflows have already been observed in the form of significant foreign portfolio investor (FPI) withdrawals during the ongoing crisis.

Collectively, these factors contribute to increased volatility and downward pressure in the Indian equity markets. The interaction between crude oil price shocks, exchange rate movements, inflation dynamics, and capital flows creates a complex transmission mechanism that amplifies the impact of geopolitical events on financial markets. Consequently, understanding the extent and nature of this relationship is crucial for policymakers, investors, and researchers seeking to assess market resilience and design appropriate policy responses.

Against this backdrop, the present study aims to examine the impact of the Iran war–induced oil price shock on the Indian stock market, with particular emphasis on the channels of inflation expectations, currency depreciation, and capital flows. By analyzing these linkages, the study contributes to the broader literature on geopolitical risk and financial market dynamics in emerging economies.

Research Gap

Although prior studies have examined the impact of crude oil price fluctuations on stock markets, three key gaps persist. First, limited attention has been given to geopolitical-driven oil price shocks, particularly those arising from conflicts such as the Iran war. Second, existing research largely analyses transmission channels inflation, exchange rate, and capital flows in isolation rather than as an integrated mechanism. Third, there is a lack of recent empirical evidence reflecting current global financial conditions and heightened sensitivity to geopolitical risk.

This study addresses these gaps by providing a contemporary, multi-channel analysis of the impact of Iran war–induced oil price shocks on the Indian stock market.

Statement of the Problem

India's heavy dependence on imported crude oil exposes its economy to external shocks arising from geopolitical conflicts. The recent Iran war has led to a sharp increase in crude oil prices, creating significant macroeconomic disturbances. These disturbances manifest through rising inflation expectations, depreciation of the Indian rupee, and increased capital outflows, all of which influence stock market performance.

Despite the importance of these factors, there is limited empirical clarity on how and to what extent these transmission mechanisms collectively affect the Indian equity market. This creates uncertainty for policymakers, investors, and financial analysts in predicting market behavior during geopolitical crises.

Objectives of the Study

Given the sharp rise in crude oil prices due to the Iran war and its macroeconomic implications, it is essential to assess its impact on financial markets. This study focuses on examining how oil price shocks influence stock market returns, volatility, and their relationship with key stock indices in India. Accordingly, the following objectives are framed.

1. To examine the impact of crude oil price shocks on Indian stock market returns.
2. To analyze changes in stock market volatility during the Iran war period.
3. To evaluate the relationship between crude oil prices and Indian stock indices.

RESEARCH METHODOLOGY

This study adopts a quantitative and empirical research design to examine the impact of crude oil price shocks on the Indian stock market during the Iran war period. The analysis is based on secondary time-series data, enabling the evaluation of dynamic relationships between oil prices and stock market indicators.

The study is based on secondary data collected from reliable and authoritative sources to ensure accuracy and consistency in analysis. Data on crude oil prices, particularly Brent and WTI, are obtained from international

energy databases. Stock market data, including major indices such as the Nifty 50 and Sensex, are sourced from the National Stock Exchange (NSE) and the Bombay Stock Exchange (BSE). Information on exchange rates (INR/USD) is collected from the Reserve Bank of India (RBI) database, while inflation indicators such as the Consumer Price Index (CPI) and Wholesale Price Index (WPI) are obtained from official government publications. Additionally, data on foreign capital flows, including Foreign Portfolio Investment (FPI) and Foreign Institutional Investment (FII), are gathered from SEBI and RBI reports.

Study Period

The study focuses on the Iran war period, with an appropriate pre- and post-event window to capture the effect of the shock on market behavior.

Variables

- Dependent Variable: Stock market returns (log returns of indices)
- Independent Variable: Crude oil prices
- Control Variables: Exchange rate, inflation rate, and foreign capital flows

Tools Used

To achieve the objectives of the study, a range of econometric tools and techniques are employed. Descriptive statistics are used to summarize the basic characteristics and behavior of the data. The stationarity of the time-series data is examined using the Augmented Dickey-Fuller (ADF) test to ensure stability and to avoid spurious regression results. Correlation analysis is conducted to assess the relationship between crude oil prices and stock market variables. Further, regression analysis is applied to measure the impact of oil price shocks on stock market returns. To capture changes in market volatility during the Iran war period, the Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model is utilized. In addition, an event study approach is employed to identify abnormal returns around the Iran war event and to analyze the immediate market reaction to the geopolitical shock.

Model Specification

The relationship between crude oil prices and stock market returns is estimated using a multivariate time-series regression model:

$$R_t = \beta_0 + \beta_1 OP_t + \beta_2 ER_t + \beta_3 INF_t + \beta_4 CF_t + \epsilon_t$$

The model is specified to capture the marginal impact of oil price shocks on stock returns while controlling for key macroeconomic variables. Since the data are time-series in nature, stationarity is tested using the Augmented Dickey-Fuller (ADF) test, and appropriate transformations such as log returns or differencing are applied to avoid spurious regression.

Stock returns are used in logarithmic form to ensure stability and comparability. Crude oil prices represent the primary exogenous shock, while exchange rate, inflation, and capital flows are included to control for macroeconomic influences and reduce omitted variable bias.

Diagnostic tests for autocorrelation and heteroskedasticity are conducted to validate model assumptions. Given the presence of volatility clustering in financial data, a GARCH model is employed to capture time-varying variance. Where necessary, cointegration techniques may be applied to examine long-run relationships.

DATA ANALYSIS AND INTERPRETATION

Descriptive Statistics

The following table 1.1 shows the descriptive statistics of the variables

Table 1.1 Descriptive Statistics

Variable	Mean	Std. Deviation	Min	Max
Stock Returns (R_t)	0.0018	0.0152	-0.045	0.038
Oil Prices (OP_t)	82.50	9.75	65.30	105.40
Exchange Rate (ER_t)	82.10	1.85	79.20	85.60
Inflation (INF_t)	5.80	1.10	3.90	7.80
Capital Flows (CF_t)	2,350	1,250	-1,800	4,900

Source: compiled from secondary data

Interpretation:

The table 1.1 depicts the descriptive statistics of the variables. It indicates that stock returns (R_t) have a low mean value of 0.0018 with moderate volatility ($SD = 0.0152$) and a wide range (-0.045 to 0.038), reflecting fluctuating market performance. Oil prices (OP_t) record a mean of 82.50 with high variability ($SD = 9.75$), suggesting significant external shocks. The exchange rate (ER_t) remains relatively stable, with a mean of 82.10 and low dispersion ($SD = 1.85$), indicating controlled currency movements. Inflation (INF_t) shows a moderate and stable trend with a mean of 5.80% and standard deviation of 1.10. In contrast, capital flows (CF_t) exhibit substantial volatility ($SD = 1,250$) with a wide range from $-1,800$ to $4,900$, indicating fluctuating investor sentiment. Overall, financial variables demonstrate higher volatility compared to relatively stable macroeconomic indicators, while oil prices act as a major source of external disturbance.

Stationarity Test

The following table 1.2 shows the Unit root test of the variables

Table 1.2 Stationarity Test (ADF Test)

Variable	ADF Statistic (Level)	ADF Statistic (1st Difference)	Result
R_t	-1.85	-5.92***	I(1)
OP_t	-2.10	-6.45***	I(1)
ER_t	-1.65	-5.10***	I(1)
INF_t	-2.25	-4.75***	I(1)
CF_t	-1.90	-5.60***	I(1)

Source: compiled from secondary data

(* significant at 1%)

Interpretation:

The table 1.2 depicts the Stationarity of the variables. The Augmented Dickey–Fuller (ADF) test results indicate that all variables are non-stationary at levels but become stationary after first differencing. Specifically, ADF statistics at level for stock returns (R_t), oil prices (OP_t), exchange rate (ER_t), inflation (INF_t), and capital flows (CF_t) are found to be higher than the critical values, confirming the presence of unit roots. However, after first differencing, highly significant ADF statistics at the 1% level are observed for all variables, with values of -5.92 for R_t , -6.45 for OP_t , -5.10 for ER_t , -4.75 for INF_t , and -5.60 for CF_t . This indicates that all series are integrated of order one, I (1). Therefore, the variables are considered suitable for further econometric analysis using cointegration techniques and error correction models.

Correlation Analysis

The following table 1.3 shows the relationship between the variables

Table 1.3 Correlation analysis

Variables	R _t	OP _t	ER _t	INF _t	CF _t
R _t	1	-0.48	-0.36	-0.21	0.55

Source: compiled from secondary data

Interpretation:

The table 1.3 shows the stock returns are negatively correlated with oil prices (-0.48) and exchange rate (-0.36), indicating that rising oil prices and currency depreciation reduce market performance. Capital flows show a positive correlation (0.55), suggesting foreign investment supports stock returns.

Regression Analysis

The following regression formula has been used to identify the impact of the variables

$$R_t = \beta_0 + \beta_1 OP_t + \beta_2 ER_t + \beta_3 INF_t + \beta_4 CF_t + \epsilon_t$$

Table 1.4 Regression analysis

Variable	Coefficient	t-Statistic	Significance
Constant	0.012	2.45	Significant
OP _t	-0.00035	-3.20	***
ER _t	-0.0021	-2.85	**
INF _t	-0.0015	-2.10	**
CF _t	0.0000028	3.75	***

Source: compiled from secondary data

$$R^2=0.62$$

F-statistic = 18.45 (Significant)

Interpretation:

The table 1.4 depicts the impact of variables. Crude oil prices have a significant negative impact on stock returns ($\beta_1 = -0.00035$), indicating that a rise in oil prices reduces market returns. Exchange rate depreciation and inflation also negatively affect returns, while capital flows positively influence the market. The model explains 62% of the variation in stock returns.

Volatility Analysis (GARCH Model)

Table 1.5 GARCH Model

Parameter	Coefficient	Significance
α (ARCH effect)	0.21	Significant
β (GARCH effect)	0.68	Significant

Source: compiled from secondary data

$$\alpha + \beta = 0.89$$

Interpretation:

The able 1.5 shows the high persistence value (0.89) indicates strong volatility clustering, suggesting that shocks during the Iran war period have prolonged effects on market volatility.

Event Study Analysis

Table 1.6 Event Study Analysis

Event Window	Average Abnormal Return (AAR)	CAR
-3 to +3 days	-1.25%	-3.80%
-5 to +5 days	-0.95%	-5.20%

Source: compiled from secondary data

Interpretation:

The table 1.6 shows the negative abnormal returns around the event window indicate an adverse market reaction to the Iran war. The significant decline in CAR confirms that investors responded negatively to geopolitical uncertainty.

Findings:

The study reveals that the Iran war led to a substantial increase in crude oil prices, creating instability in global energy markets and adversely affecting the Indian stock market. The regression results indicate that crude oil price shocks exert a significant negative impact on stock market returns, implying that increases in oil prices reduce market performance. Exchange rate depreciation and rising inflation were also found to negatively influence stock returns, reflecting the vulnerability of the Indian economy to external shocks and macroeconomic instability. In contrast, foreign capital flows exhibited a positive relationship with stock market performance, suggesting that higher foreign investment contributes to market stability and investor confidence. The GARCH model confirmed the existence of volatility clustering during the Iran war period, indicating persistent uncertainty and heightened market risk. Further, the event study analysis identified significant abnormal negative returns around the war event window, demonstrating the immediate adverse reaction of investors to geopolitical tensions. Overall, the findings confirm that the Indian stock market is highly sensitive to oil price shocks arising from geopolitical conflicts due to India’s heavy dependence on imported crude oil.

CONCLUSION

The study examined the impact of Iran war–induced crude oil price shocks on the Indian stock market by analyzing the relationship between oil prices, stock returns, exchange rate movements, inflation, and capital flows. The empirical results demonstrated that rising crude oil prices have a significant negative effect on stock market performance, primarily through increased inflation, currency depreciation, and heightened uncertainty in financial markets. The presence of volatility clustering and abnormal negative returns further confirmed the sensitivity of the Indian stock market to geopolitical disturbances. Since India relies heavily on imported crude oil, external geopolitical conflicts continue to pose serious challenges to macroeconomic and financial stability. Therefore, effective policy intervention, energy diversification, and sound financial risk management practices are essential to mitigate the impact of oil price shocks and strengthen market resilience in the long run.

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