



Impact of Crude Oil Price Fluctuations on the Indian Rupee–Us Dollar Exchange Rate

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Abstract – Crude oil is an important commodity that significantly influences the economic and financial conditions of oil-importing countries such as India. Since India depends substantially on imported crude oil and international crude oil transactions are mainly denominated in U.S. dollars, fluctuations in crude oil prices can affect the demand for foreign currency and create pressure on the Indian Rupee–U.S. Dollar exchange rate. This study examines the impact of crude oil price fluctuations on the Indian Rupee–US Dollar exchange rate during the period from July 2024 to June 2026. The study focuses on Brent crude oil prices and the USD/INR exchange rate using 24 monthly observations of secondary data. Microsoft Excel and Power BI are used for data organization, analysis and visualization, while trend analysis and Pearson correlation are used to examine the movement and relationship between the variables. The study also considers selected major geopolitical events in West Asia and their associated movements in crude oil prices and the exchange rate. The correlation analysis resulted in a coefficient of 0.2007, indicating a weak positive relationship between Brent crude oil prices and the USD/INR exchange rate during the study period. The findings also show that crude oil prices experienced greater fluctuations during major geopolitical developments, while exchange rate movements were comparatively moderate. The study highlights the interconnected nature of global crude oil markets and India's foreign exchange market and provides useful insights into the relationship between energy prices and currency movements in the Indian economy.

Keywords - Brent Crude Oil, Crude Oil Price Fluctuations, USD/INR Exchange Rate, Indian Rupee, Foreign Exchange Market, Geopolitical Events, India, Oil Imports, Correlation Analysis.

I. INTRODUCTION

1. Background of the Study

Crude oil is one of the most important commodities in the global economy because it is widely used for transportation, electricity generation, manufacturing, agriculture and several other economic activities. Changes in crude oil prices can therefore influence not only the cost of energy but also inflation, trade, investment, economic growth and financial markets. For developing and import-dependent countries such as India, fluctuations in international crude oil prices are particularly important because changes in the price of imported crude directly affect the country's import expenditure and demand for foreign currency. This creates an important connection between crude oil prices and the exchange rate of the Indian rupee against the U.S. dollar.

India is highly dependent on imported crude oil to meet its domestic energy requirements. Since crude oil is internationally traded mainly in U.S. dollars, Indian oil importers need to purchase dollars to make payments for crude oil imports. Therefore, when international crude oil prices increase, the amount of dollars required to pay for India's oil imports generally increases, particularly when import volumes remain high. This can increase demand for U.S. dollars in the foreign exchange market and put pressure on the Indian rupee. The Reserve Bank of India (RBI) has highlighted that India's strong dependence on crude oil imports makes the economy vulnerable to international crude price shocks. RBI research has also

found that higher crude prices can worsen India's trade and current account balances.

The exchange rate represents the value of one currency in terms of another currency. In the case of the Indian rupee–U.S. dollar exchange rate, it is commonly expressed as INR/USD, meaning the number of Indian rupees required to purchase one U.S. dollar. For example, if the exchange rate changes from ₹83 per U.S. dollar to ₹86 per U.S. dollar, more rupees are required to purchase the same one dollar. This indicates depreciation of the Indian rupee against the U.S. dollar. On the other hand, if the rate changes from ₹86 to ₹83 per dollar, the rupee has appreciated against the dollar.

The relationship between crude oil prices and the rupee–dollar exchange rate can be understood mainly through India's trade and foreign exchange requirements. When crude oil prices rise, India's oil import bill may increase. This can result in greater demand for U.S. dollars because oil imports require foreign currency payments. Higher dollar demand can place downward pressure on the rupee. A weaker rupee can, in turn, make imported crude oil more expensive when measured in Indian rupees. This creates a potentially reinforcing relationship between international oil prices and domestic import costs.

The Reserve Bank of India has observed that crude oil is a major contributor to India's import requirements and that an increase in crude prices can significantly affect the country's trade deficit and current account deficit.



According to an RBI study, crude oil has consistently represented a significant share of India's import basket, making the Indian economy sensitive to international oil price movements. The Petroleum Planning and Analysis Cell (PPAC) of the Government of India also maintains official data on India's crude oil and petroleum product imports and exports, demonstrating the importance of petroleum trade to India's external sector.

The relationship, however, is not always simple or one-directional. The rupee-dollar exchange rate is influenced by several other factors, including U.S. interest rates, the strength of the U.S. dollar, foreign investment flows, inflation, interest-rate differentials, India's trade balance, geopolitical developments and market expectations. Therefore, an increase in crude oil prices does not automatically result in an equal or immediate fall in the value of the rupee. The impact can differ depending on the size of the oil price movement, the volume of oil imports, capital inflows, foreign exchange reserves and monetary policy conditions.

The role of the RBI is also important in understanding this relationship. The RBI manages India's foreign exchange reserves and may intervene in the foreign exchange market to reduce excessive volatility in the rupee. When the rupee faces strong depreciation pressure, the RBI can sell U.S. dollars from its reserves, increasing the supply of dollars in the market and helping to moderate the pressure on the rupee. Recent market developments have illustrated this mechanism, with the RBI reportedly intervening in the foreign exchange market when rising oil prices and increased dollar demand placed pressure on the rupee.

Crude oil price fluctuations can also influence inflation in India. Petroleum products are important inputs for transportation, manufacturing, logistics and other economic activities. When crude oil prices increase, production and transportation costs may rise, which can eventually influence the prices of goods and services. If the rupee also depreciates at the same time, the rupee cost of imported crude can increase further. RBI research published in 2025 noted that a 10 percent increase in global crude oil prices could raise inflation by approximately 20 basis points, although the actual effect depends on government intervention and the degree to which international price changes are passed through to domestic prices.

Recent developments further demonstrate why this relationship remains relevant. In 2026, increases in global crude oil prices associated with geopolitical tensions were accompanied by renewed pressure on the Indian rupee. Market reports indicated that rising Brent crude prices increased concerns about India's import costs and dollar demand, while RBI intervention helped cushion some of the pressure on the rupee. Such developments show that

crude oil prices and exchange rates are closely connected to broader international economic and geopolitical conditions.

Another important factor is that changes in the rupee-dollar exchange rate can themselves affect India's oil import expenditure. Even if the international crude oil price remains unchanged in U.S. dollars, depreciation of the rupee means that Indian importers need more rupees to purchase the same quantity of crude oil. Thus, there can be a two-way economic interaction: higher crude oil prices can increase pressure on the rupee, while rupee depreciation can increase the domestic cost of imported crude oil. The Government of India has also noted that India's oil import bill depends on several factors, including international oil prices, import requirements, logistics costs, contractual conditions and the INR-USD exchange rate.

Against this background, studying the relationship between crude oil price fluctuations and the Indian rupee-U.S. dollar exchange rate is important for understanding India's external economic position. It is particularly relevant for policymakers, importers, exporters, investors, financial institutions and businesses that are exposed to changes in energy costs and foreign exchange rates. Understanding this relationship can help in assessing the possible effects of oil price shocks on India's trade balance, inflation and currency stability.

The present study, titled "Impact of Crude Oil Price Fluctuations on the Indian Rupee-US Dollar Exchange Rate," focuses specifically on examining how changes in crude oil prices are associated with movements in the INR-USD exchange rate. The study uses secondary data on crude oil prices and the Indian rupee-U.S. dollar exchange rate and applies statistical and analytical techniques to identify trends and determine the nature and extent of the relationship between the two variables. By examining this relationship, the study seeks to provide a clearer understanding of how changes in global crude oil prices can influence India's foreign exchange market and the value of the Indian rupee.

Overall, crude oil prices and the rupee-dollar exchange rate are important indicators of India's external economic stability. Since India depends substantially on imported crude oil and international oil transactions are largely dollar-denominated, fluctuations in crude prices can create significant foreign exchange implications. Therefore, analysing the impact of crude oil price fluctuations on the Indian rupee-U.S. dollar exchange rate provides valuable insight into one of the important linkages between global commodity markets and the Indian economy.



2. Problem Statement and Objectives

Statement of the Problem

Crude oil is one of the most important commodities influencing the economic performance of oil-importing countries such as India. India depends heavily on imports to meet its domestic crude oil requirements, making the country vulnerable to fluctuations in international crude oil prices. Since crude oil is primarily traded internationally in U.S. dollars, changes in crude oil prices can directly influence the demand for U.S. dollars in India and, consequently, affect the Indian Rupee–U.S. Dollar (INR/USD) exchange rate.

When crude oil prices increase, India's expenditure on crude oil imports may also increase, leading to a higher demand for U.S. dollars to make international payments. This can create pressure on the Indian Rupee and may result in its depreciation against the U.S. Dollar. Similarly, a decline in crude oil prices may reduce India's import expenditure and foreign currency requirements, potentially reducing pressure on the Rupee. However, the relationship is not always direct because the INR/USD exchange rate is also influenced by other factors such as U.S. dollar movements, interest rates, inflation, foreign investment, trade balance, monetary policy and global economic conditions.

The major problem is that fluctuations in crude oil prices can create uncertainty for India's import costs, inflation, trade balance and currency stability. A sudden increase in crude oil prices can therefore have wider implications for businesses, investors and policymakers. At the same time, changes in the exchange rate can further affect the rupee cost of imported crude oil, creating an interconnected relationship between crude oil prices and the exchange rate.

Therefore, there is a need to examine whether changes in crude oil prices have a significant relationship with movements in the Indian Rupee–U.S. Dollar exchange rate.

Objectives of the Study

- To analyze the trends in crude oil prices and the INR/USD exchange rate
- To examine the relationship between crude oil price fluctuations and foreign exchange rate movements
- To assess the impact of major geopolitical events in West Asia on crude oil prices and currency fluctuations

3. Scope and Significance of the Study

- The study focuses on the relationship between crude oil price fluctuations and the Indian Rupee–US Dollar exchange rate.
- The study is limited to the Indian economy and its foreign exchange market.

- The study considers Brent crude oil prices and the INR/USD exchange rate as the main variables.
- The study uses monthly secondary data for the selected study period.
- The study examines the trend and movement of crude oil prices and the INR/USD exchange rate.
- The study analyses the relationship between crude oil price fluctuations and exchange rate movements.

Significance of the Study

The study is significant for the following reasons:

- To understand the importance of crude oil prices in the Indian economy, as India depends significantly on imported crude oil.
- To study why crude oil price fluctuations affect the INR–USD exchange rate, since crude oil imports require payments in U.S. dollars.
- To examine the impact of changes in crude oil prices on the Indian Rupee, particularly whether rising oil prices create pressure for rupee devaluation.
- To analyse the relationship between crude oil prices and the INR–USD exchange rate using two-year monthly secondary data and identify the trend and level of impact.
- To provide useful insights for economic decision-making, especially for policymakers, businesses and investors in managing the effects of oil price and exchange rate fluctuations

Chapter Scheme

Table 1: Chapter Scheme

Chapter	Contents
Chapter 1	Introduction: Background of the Study, Problem Statement and Objectives, Scope and Significance of the Study
Chapter 2	Literature Review: Review of Literature, Industry / Business Analysis, Research / Business Gap, Theoretical/Conceptual Framework
Chapter 3	Research Methodology: Research Design, Data Sources and Sampling, Data Collection and Analysis
Chapter 4	Data Analysis, Findings and Discussion: Data Analysis and Results, Findings and Discussion, Managerial Implications
Chapter 5	Conclusion and Recommendations: Conclusion, Recommendations and Implementation Plan, Limitations and Future Scope

II. LITERATURE REVIEW

This chapter reviews the existing literature on the relationship between crude oil prices and exchange rates,



presents an analysis of the crude oil industry, identifies the research gap addressed by the present study and explains the conceptual framework on which the analysis is based.

1. Review of Literature

Chen, Chang, Fu, and Xie (2024) examined the relationship between crude oil prices and exchange rates in both oil-importing and oil-exporting countries. The researchers found that changes in crude oil prices significantly influence currency values, especially during periods of economic uncertainty. Oil-importing countries tend to experience currency depreciation when oil prices rise because their import costs increase. From this study, I understood that fluctuations in crude oil prices play an important role in determining exchange rate movements, particularly for countries like India that depend heavily on crude oil imports.

Louka and Michail (2024) investigated the relationship between oil prices and the euro exchange rate using cointegration analysis. The study found that oil prices, interest rates, and stock market performance jointly influence exchange rate movements in the long run. From this study, I understood that exchange rates are affected not only by crude oil prices but also by broader macroeconomic and financial factors.

Ben Salem, Zayati, Nouria, and Rault (2024) analyzed volatility spillovers between crude oil prices and exchange rates across major oil-importing and oil-exporting countries. The researchers observed strong volatility transmission during crises such as COVID-19 and the Russia–Ukraine conflict. From this study, I understood that global economic shocks strengthen the relationship between oil prices and exchange rate volatility.

Siddiqui, Ahmed, Naushad, and Khan (2023) conducted a systematic literature review on the relationship between crude oil prices and exchange rates by reviewing studies published between 1998 and 2022. The study concluded that the relationship remains highly relevant for policymakers and investors, although findings differ across countries and methodologies. From this study, I understood that the oil price–exchange rate relationship continues to be an important area of research with significant policy implications.

Beckmann, Czudaj, and Arora (2020) revisited the theoretical and empirical relationship between oil prices and exchange rates. The researchers found evidence of both short-run and long-run interactions, with the strength of the relationship varying across countries and time periods. From this study, I understood that exchange rates and crude oil prices influence each other through dynamic and time-varying mechanisms.

Amano and van Norden (1998) examined the long-run relationship between oil prices and exchange rates in major industrial economies. The study found that real oil prices significantly explain movements in exchange rates over time. From this study, I understood that crude oil prices are an important determinant of long-term exchange rate behavior.

Chen and Chen (2007) investigated whether real oil prices could predict real exchange rates for G7 countries. The researchers found a stable long-run relationship between these variables. From this study, I understood that crude oil prices can serve as a useful indicator for forecasting exchange rate movements.

Narayan, Narayan, and Prasad (2008) analyzed the impact of oil price shocks on exchange rates using time-series techniques. The study revealed that oil price fluctuations significantly influence exchange rates, particularly in oil-importing economies. From this study, I understood that countries dependent on imported crude oil are more vulnerable to currency fluctuations.

Lizardo and Mollick (2010) explored the effect of oil prices on the exchange rates of major exporting and importing countries. The researchers found that rising oil prices generally strengthen the currencies of oil-exporting nations while weakening those of oil-importing nations. From this study, I understood that a country's oil trade position determines how crude oil prices affect its currency.

Basher, Haug, and Sadorsky (2012) studied the relationship between oil prices, exchange rates, and emerging market economies. The findings showed that oil price shocks significantly affect exchange rates and financial markets in developing countries. From this study, I understood that emerging economies are highly sensitive to fluctuations in global crude oil prices.

Reboredo (2012) examined the dependence between oil prices and exchange rates using copula methods. The study found that the relationship becomes stronger during periods of financial instability and market stress. From this study, I understood that extreme economic events increase the interconnectedness between crude oil prices and exchange rates.

Turhan, Hacıhasanoglu, and Soytas (2013) investigated the dynamic relationship between oil prices and exchange rates in emerging economies. The researchers found bidirectional causality in several countries, indicating that both variables influence each other over time. From this study, I understood that crude oil prices and exchange rates have a mutually reinforcing relationship in many developing economies.



Xu, Han, Wan, and Yin (2019) examined the dynamic relationship between crude oil prices and exchange rates using a non-linear modelling approach. The study found that the relationship between oil prices and exchange rates changes over time and is influenced by business cycles and oil demand shocks. From this study, I understood that the impact of crude oil prices on exchange rates is dynamic rather than constant and depends on prevailing economic conditions.

Benhmad (2019) investigated the directional relationship between crude oil prices and real exchange rates in BRIC countries. The study found that oil price movements have predictive power for exchange rate changes in countries such as India, Brazil, and Russia, particularly after the global financial crisis. From this study, I understood that crude oil prices are an important indicator for predicting exchange rate movements in emerging economies.

Yiew, Yip, Tan, Habibullah, and Khadijah (2019) examined whether crude oil prices could predict exchange rate movements in India. The researchers found that oil prices significantly improve the prediction of exchange rate fluctuations and provide useful information for policymakers and investors. From this study, I understood that crude oil prices can be used as a reliable predictor of exchange rate behaviour in India.

Jawadi, Louhichi, and Ben Ameer (2016) analyzed the volatility relationship between oil prices and exchange rates using high-frequency data. The study found strong interactions between oil price volatility and currency market volatility during periods of financial uncertainty. From this study, I understood that oil price volatility has a direct influence on exchange rate fluctuations in the short run.

Zhang (2013) studied the relationship between crude oil prices and the value of the US dollar while accounting for structural breaks. The study found that oil prices and the US dollar have a significant long-run relationship when major structural changes are considered. From this study, I understood that structural economic events play an important role in determining the relationship between crude oil prices and exchange rates.

Reboredo and Rivera-Castro (2013) examined the dependence between crude oil prices and exchange rates using wavelet decomposition techniques. The researchers found that the strength of the relationship varies across different time horizons and market conditions. From this study, I understood that the oil price–exchange rate relationship changes over time and should be analysed using both short-term and long-term perspectives.

Yousefi and Wirjanto (2004) examined the role of exchange rates in crude oil price formation. The

researchers found that exchange rate movements significantly influence international crude oil prices and market behaviour. From this study, I understood that exchange rates and crude oil prices have a two-way relationship that affects global energy markets.

Amano and van Norden (2000) investigated the long-run relationship between crude oil prices and exchange rates in major industrial economies. The study found that real oil prices explain a significant portion of long-term exchange rate movements. From this study, I understood that crude oil prices are one of the key determinants of exchange rate behaviour in the global economy

2. Industry / Business Analysis

The crude oil industry is one of the most important industries in the global energy sector and plays a major role in economic development. Crude oil is a naturally occurring fossil fuel that is refined into various petroleum products such as petrol, diesel, aviation fuel, LPG, lubricants and other industrial products. It is widely used in transportation, manufacturing, agriculture, electricity generation and several other economic activities. Therefore, fluctuations in crude oil prices can have a significant effect on production costs, inflation, trade and financial markets.

India is one of the major consumers of crude oil and depends significantly on imports to meet its domestic energy requirements. Since crude oil is mainly traded internationally in U.S. dollars, changes in global crude oil prices directly affect India's import expenditure and demand for foreign currency. When crude oil prices increase, the cost of India's oil imports generally rises, which can increase the demand for U.S. dollars and create pressure on the Indian Rupee.

The crude oil industry consists of three major activities: upstream, midstream and downstream. Upstream activities involve exploration and production of crude oil. Midstream activities include transportation, storage and distribution of crude oil. Downstream activities involve refining crude oil into petroleum products and supplying them to consumers and industries.

Crude oil prices are influenced by several factors, including global demand and supply, production decisions of major oil-producing countries, economic conditions, geopolitical tensions, natural disasters and changes in market expectations. Geopolitical developments, particularly in oil-producing regions, can cause sudden changes in crude oil prices and create uncertainty in global markets.

For India, the crude oil industry is closely connected with the country's external sector because crude oil forms a significant part of its import requirements. Higher crude oil

prices can increase the trade deficit and current account pressure. Therefore, understanding the crude oil industry is important for studying its relationship with the Indian Rupee–US Dollar exchange rate, which is the main focus of this study.

3. Research / Business Gap

The review of literature reveals the following gaps in existing research:

- Most previous studies focused on the long-term relationship between crude oil prices and exchange rates rather than recent market developments.
- Many studies analyzed global markets or multiple countries, with limited emphasis on India, which is one of the world's largest crude oil-importing countries.
- Existing research mainly examined the impact of earlier events such as the Global Financial Crisis, COVID-19, and the Russia–Ukraine conflict, while very few studies have focused on the recent West Asia (Iran–Israel) conflict.
- Several studies investigated the relationship between crude oil prices and exchange rates but did not specifically analyze the INR/USD exchange rate.
- Most researchers used historical datasets, making their findings less relevant to current geopolitical and economic conditions.
- Previous studies adopted different methodologies and reported inconsistent results regarding the strength and direction of the relationship between crude oil prices and exchange rates.
- Limited research has examined how geopolitical tensions in West Asia influence India's crude oil import costs and foreign exchange market simultaneously.
- Few studies have used recent two-year monthly secondary data to analyze the impact of crude oil price fluctuations on the Indian Rupee.
- Existing studies have not extensively used interactive data visualization tools such as Power BI to present trends and relationships between crude oil prices and exchange rates.

Therefore, the present study aims to fill these gaps by analyzing the impact of Brent crude oil price fluctuations, particularly those arising from recent West Asian geopolitical developments, on the INR/USD exchange rate using two years of monthly secondary data.

4. Theoretical/Conceptual Framework

The conceptual framework of this study is based on the well-recognised link between international oil markets and the foreign exchange market of an oil-importing economy. India meets a large share of its crude oil requirement through imports, and international crude oil transactions are mainly settled in U.S. dollars. A change in the price of crude oil therefore changes the amount of foreign currency

required by Indian importers, which in turn affects the demand for U.S. dollars in the foreign exchange market and the value of the rupee. The framework rests on the following channels:

- Import bill channel: higher Brent crude oil prices increase India's oil import expenditure and the demand for U.S. dollars, which creates pressure on the rupee and tends to raise the USD/INR exchange rate.
- Terms-of-trade channel: as noted by Lizardo and Mollick (2010), rising oil prices tend to strengthen the currencies of oil-exporting countries and weaken those of oil-importing countries such as India.
- Geopolitical channel: conflicts and supply disruptions in West Asia cause sudden movements in crude oil prices and market sentiment, which can influence the exchange rate directly and through crude oil prices.
- Moderating factors: RBI intervention, the strength of the U.S. dollar, interest-rate differentials, foreign investment flows and inflation can strengthen or offset the effect of crude oil prices on the exchange rate.

Figure 2.1 presents the framework. Brent crude oil price is treated as the independent variable and the USD/INR exchange rate as the dependent variable, while geopolitical events and other macroeconomic factors influence the relationship. Consistent with the literature reviewed, the study expects that rising Brent prices are associated with a higher USD/INR rate (a weaker rupee), although the strength of the association may be moderated by other factors.

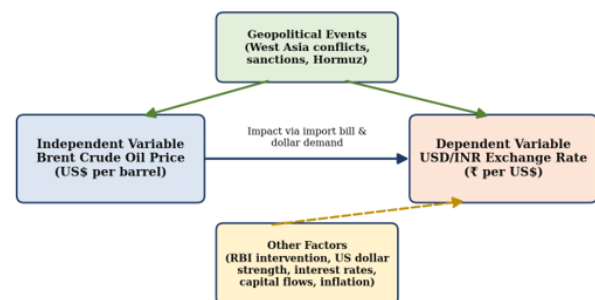


Figure 2.1: Conceptual Framework of the Study

III. RESEARCH METHODOLOGY

This chapter describes the research methodology adopted for the study, including the research design, the sources of data, the sampling approach, the method of data collection and the tools used for analysis.

1. Research Design

The study adopts a quantitative and analytical research design to examine the impact of crude oil price fluctuations on the Indian Rupee–US Dollar exchange rate. The study analyses numerical data relating to Brent crude oil prices and the INR/USD exchange rate for the selected study period. The research is also ex-post facto in nature,



as it examines events and data that have already occurred without manipulating the variables. Trend analysis and Pearson correlation are used to understand the movement and relationship between crude oil prices and the exchange rate. The study also considers major geopolitical events in West Asia to assess their influence on crude oil prices and currency movements. The research design is suitable for identifying patterns and relationships between the selected variables.

2. Data Sources and Sampling

Nature and Source of Data

The study is based entirely on secondary data. Monthly data on Brent crude oil prices and the INR/USD exchange rate are collected from reliable and publicly available sources. Sources may include financial and economic databases such as Investing.com, RBI, Trading Economics and other official or reliable sources, depending on data availability. Information relating to major geopolitical events is collected from reliable news and economic sources. The selected data are organized according to the study period and used for statistical analysis. The use of secondary data is appropriate because the study focuses on historical movements in crude oil prices and exchange rates.

Sampling Method

The study uses purposive sampling, as the data are selected based on their relevance to the research objectives. Monthly observations of Brent crude oil prices and the INR/USD exchange rate are specifically chosen because they directly represent the two major variables of the study. The selected period and observations are considered appropriate for analysing trends, relationships and the influence of major geopolitical events.

Sample Size

The sample size consists of 24 monthly observations covering the selected two-year study period. Each observation contains the corresponding Brent crude oil price and INR/USD exchange rate for the same month. This provides a total of 24 paired observations for analysing the relationship between the two variables.

3. Data Collection and Analysis

Data Collection Method

The data for the study are collected through secondary data collection methods. Monthly Brent crude oil price data and INR/USD exchange rate data are obtained from reliable online databases and official economic sources. The collected data are arranged month-wise in Microsoft Excel to ensure that both variables correspond to the same time period. Additional information regarding major geopolitical events is collected from reliable sources and matched with the relevant period of crude oil and exchange rate movements. The data are then cleaned, organized and prepared for further statistical analysis.

Tools Used for Data Analysis

The collected data has been analyzed using the following tools:

Microsoft Excel

Microsoft Excel is used for data cleaning, organizing the dataset, performing basic calculations, and preparing tables and charts.

Power BI

Power BI is used to create interactive dashboards and visual representations that help in understanding trends and relationships between crude oil prices and the INR/USD exchange rate.

Trend Analysis

Trend analysis is used to examine the movement of Brent crude oil prices and the INR/USD exchange rate over the selected study period.

Correlation Analysis

Correlation analysis is used to measure the strength and direction of the relationship between Brent crude oil prices and the INR/USD exchange rate.

Table 2: Summary of Research Methodology

Particulars	Details
Research design	Quantitative, analytical and ex-post facto
Nature of data	Secondary data
Variables	Brent crude oil price (US\$ per barrel) and USD/INR exchange rate
Study period	July 2024 to June 2026
Data sources	Investing.com, RBI, Trading Economics and other official or reliable sources
Sampling method	Purposive sampling
Sample size	24 monthly observations (24 paired observations)
Tools for analysis	Microsoft Excel, Power BI, trend analysis and Pearson correlation analysis

IV. DATA ANALYSIS, FINDINGS AND DISCUSSION

This chapter presents the analysis of Brent crude oil prices and the USD/INR exchange rate for the period July 2024 to June 2026 in line with the objectives of the study, followed by the findings, a discussion of the results and their managerial implications.



1. Data Analysis and Results

Objective 1: To analyze the trends in Brent crude oil prices and the INR/USD exchange rate during the two-year period

Table 3: Monthly Brent Crude Oil Price and USD/INR Exchange Rate (July 2024 – June 2026)

Month	Brent Crude Oil Price (US\$ per barrel)	USD/INR Exchange Rate
Jul-24	85.15	93.550242
Aug-24	80.36	92.7608
Sep-24	74.02	90.730847
Oct-24	75.63	90.799085
Nov-24	74.35	90.091277
Dec-24	73.86	88.825605
Jan-25	79.27	88.4164
Feb-25	75.44	88.32259
Mar-25	72.73	87.518389
Apr-25	68.13	86.114622
May-25	64.45	85.903433
Jun-25	71.44	85.189685
Jul-25	71.04	85.561217
Aug-25	67.87	86.637663
Sep-25	67.99	87.05475
Oct-25	64.54	86.265748
Nov-25	63.8	84.986229
Dec-25	62.54	84.364361
Jan-26	66.6	84.029514
Feb-26	70.89	83.808215
Mar-26	103.13	83.89629
Apr-26	117.29	83.594655
May-26	107.14	95.52054
Jun-26	85.4	83.470916

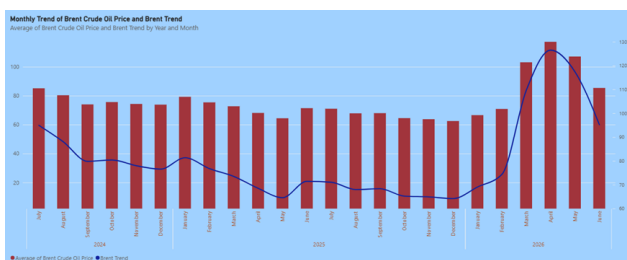


Figure 4.1: Trend of Brent Crude Oil Price (July 2024 – June 2026)

Brent Crude Oil Price: The chart shows a gradual decline in Brent crude oil prices during 2024 and the first half of 2025. Prices remained relatively stable during the middle and later parts of 2025, indicating a period of consolidation. A strong upward movement began in early 2026, with prices reaching their highest level around April. After the peak, prices declined in May and June, suggesting a noticeable market correction. Overall, the chart highlights a shift from a prolonged downward trend to a sharp and more volatile upward movement in 2026.

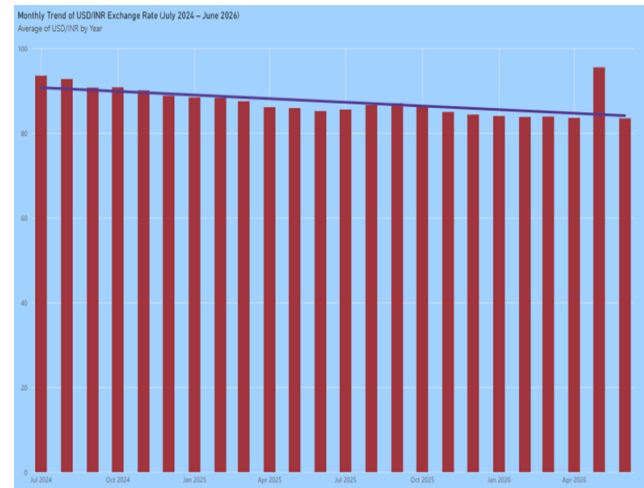


Figure 4.2: Trend of USD/INR Exchange Rate (July 2024 – June 2026)

USD/INR Exchange Rate: The chart shows a gradual decline in the USD/INR exchange rate from July 2024 to early 2026. The rate remained relatively stable through most of 2025, with only small fluctuations. A noticeable increase occurred around May 2026, indicating a temporary rise in the exchange rate. After this peak, the rate declined again in June 2026, suggesting a short-term correction. Overall, the chart indicates a mild downward trend with a brief spike in the exchange rate during 2026.

Overall Interpretation: Overall, the two charts show that Brent crude oil prices and the USD/INR exchange rate experienced relatively stable-to-declining trends during 2024–25. Brent crude showed a stronger downward movement followed by a sharp rise in early 2026, while USD/INR changed more gradually. Both indicators experienced noticeable fluctuations in 2026, with Brent showing much greater volatility than the exchange rate. The temporary rise in USD/INR around May 2026 coincided with the period of elevated Brent prices, indicating a period of increased market movement. Overall, the charts highlight changing oil-market conditions alongside gradual movements in the USD/INR exchange rate over the two-year period.

Objective 2: To examine the relationship between Brent crude oil prices and the INR/USD exchange rate

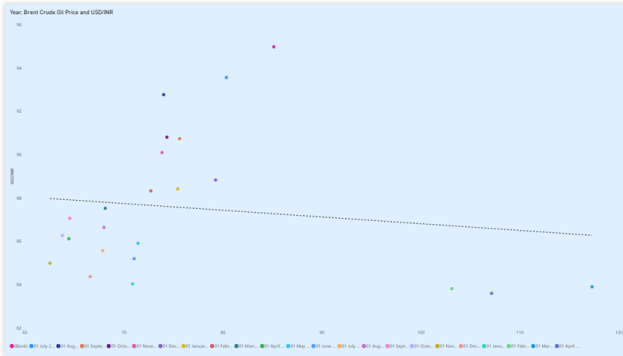


Figure 4.3: Scatter Plot of Brent Crude Oil Price and USD/INR Exchange Rate

Table 4: Pearson Correlation between Brent Crude Oil Price and USD/INR

Variables	Observations	Pearson correlation (r)	Interpretation
Brent crude oil price and USD/INR	24	0.2007	Weak positive linear relationship

The Pearson correlation analysis for the period July 2024 to June 2026 produced a correlation coefficient of 0.2007. This indicates a weak positive linear relationship between Brent crude oil prices and the USD/INR exchange rate during the study period. The positive coefficient suggests that increases in Brent crude oil prices were associated with some tendency for the USD/INR exchange rate to increase as well; however, the relatively low correlation value indicates that the relationship was weak and that changes in crude oil prices alone do not closely correspond with changes in the exchange rate. The scatter plot also provides a visual representation of the association between the two variables.

The monthly data used for the correlation analysis are given in Annexure I (Table A.1).

Objective 3: To assess the impact of major geopolitical events on Brent crude oil prices and the INR/USD exchange rate during the two-year period

Table 5: Brent Crude Oil Price and USD/INR Movement around Major Geopolitical Events

Event date	Geopolitical event	Brent before	Brent after	Brent % change	USD/INR before	USD/INR after	USD/INR % change
Oct-24	Israel–Iran escalation	71.77	71.84	+0.10%	83.783	84.564	+0.93%
Jan-25	Russia oil sanctions	74.64	72.81	−2.45%	85.582	87.471	+2.21%
Jun-25	Israel–Iran conflict	63.90	71.70	+12.21%	85.525	87.524	+2.34%
Mar-26	US–Israel/Iran conflict	72.87	110.40	+51.50%	91.076	94.91	+4.21%
Apr-26	Strait of Hormuz disruption	103.97	87.93	−15.43%	93.485	95.01	+1.63%

The event analysis examines the changes in Brent crude oil prices and the USD/INR exchange rate before and after major geopolitical events during the study period. The results show that geopolitical developments, particularly conflicts and disruptions involving major oil-producing regions, were associated with changes in both crude oil prices and the Indian Rupee–US Dollar exchange rate. In October 2024, the Israel–Iran escalation was associated with a marginal increase in Brent crude oil prices from 71.77 to 71.84 (+0.10%), while the USD/INR exchange rate increased from 83.783 to 84.564 (+0.93%). This indicates a relatively limited immediate movement in both

variables. In January 2025, following the Russia oil sanctions, Brent crude oil prices fell from 74.64 to 72.81 (−2.45%), while USD/INR increased from 85.582 to 87.471 (+2.21%). This suggests that the currency experienced a noticeable movement even though crude oil prices declined.

In June 2025, the Israel–Iran conflict was associated with an increase in Brent crude oil prices from 63.90 to 71.70 (+12.21%). During the same period, USD/INR increased from 85.525 to 87.524 (+2.34%). The most significant movement is observed in March 2026, during the US–Israel/Iran conflict. Brent crude oil prices increased



sharply from 72.87 to 110.40 (+51.50%), while USD/INR increased from 91.076 to 94.91 (+4.21%). This indicates that a major geopolitical conflict involving oil-producing regions can create substantial pressure in the crude oil market and may also contribute to rupee depreciation. In April 2026, the Strait of Hormuz disruption was associated with Brent prices moving from 103.97 to 87.93 (−15.43%), while USD/INR increased from 93.485 to 95.01 (+1.63%).

Overall, the analysis indicates that geopolitical events can create significant fluctuations in crude oil prices and influence the USD/INR exchange rate. However, the magnitude of currency movement is generally smaller than the movement in crude oil prices, suggesting that other economic and financial factors also influence the exchange rate. This is consistent with research showing that oil-price and exchange-rate relationships can vary over time and across different events.

2. Findings and Discussion

Findings

- The analysis of Brent crude oil prices shows a declining trend during 2024 and the first half of 2025, followed by relative stability during the middle and later parts of 2025. A sharp increase was observed in early 2026, with Brent crude oil reaching its highest level around April 2026 before declining in May and June.
- The USD/INR exchange rate showed a gradual declining trend from July 2024 to early 2026, with relatively small fluctuations during most of 2025. A noticeable increase occurred around May 2026, followed by a decline in June 2026.
- Brent crude oil prices experienced greater fluctuations compared with the USD/INR exchange rate during the study period. The two indicators showed different degrees of movement, particularly during 2026.
- The Pearson correlation coefficient between Brent crude oil prices and the USD/INR exchange rate was 0.2007, indicating a weak positive linear relationship during July 2024 to June 2026.
- The weak correlation indicates that changes in crude oil prices alone do not closely correspond with changes in the USD/INR exchange rate. Other economic and financial factors may also contribute to exchange-rate movements.
- The event analysis indicates that major geopolitical developments were associated with movements in both Brent crude oil prices and the USD/INR exchange rate. The magnitude of movement was generally larger for crude oil than for the exchange rate.

Discussion

The weak positive correlation of 0.2007 shows that Brent crude oil prices and the USD/INR exchange rate moved in the same direction only to a limited extent during July

2024 to June 2026. This is in line with the literature reviewed in Chapter 2, which indicates that the relationship between oil prices and exchange rates varies across time periods and market conditions (Reboredo and Rivera-Castro, 2013; Xu et al., 2019).

The event analysis shows that geopolitical developments had a much larger effect on crude oil prices than on the exchange rate. In March 2026, Brent crude oil prices rose by 51.50% while USD/INR rose by 4.21%. In January 2025, USD/INR rose by 2.21% even though Brent prices fell by 2.45%, which suggests that factors other than crude oil prices also influenced the currency. The larger movement of both variables during periods of geopolitical stress is consistent with the finding of Reboredo (2012) that the dependence between oil prices and exchange rates becomes stronger during periods of market stress.

The comparatively moderate movement of the exchange rate can also be understood in the light of the factors discussed in Chapter 1, such as the role of the RBI in reducing excessive volatility in the rupee and the influence of U.S. interest rates, foreign investment flows and other macroeconomic conditions on the USD/INR exchange rate.

3. Managerial Implications

The results of the study have the following implications for managers, investors and policymakers:

- Import-dependent businesses: Brent crude oil prices moved much more than the USD/INR exchange rate during the study period. Managers of businesses that rely on imported crude oil or petroleum products should therefore treat crude oil price risk and currency risk as separate exposures in cost planning and budgeting, and manage both through appropriate risk-management practices.
- Financial managers and investors: the weak correlation of 0.2007 shows that crude oil prices alone are not a reliable single indicator of USD/INR movements. Decisions relating to foreign exchange exposure should also consider inflation, interest rates, foreign capital flows and global financial conditions.
- Risk and strategy teams: major geopolitical developments in West Asia were associated with sharp movements in crude oil prices. Such events should be monitored closely and included in scenario planning for energy costs and foreign exchange exposure.
- Policymakers and analysts: the moderate exchange-rate response to large oil-price movements highlights the importance of foreign exchange reserves and market stabilisation measures by the RBI. Regular dashboards of Brent prices and USD/INR can support timely monitoring of external-sector risks.



V. CONCLUSION AND RECOMMENDATIONS

This chapter summarises the conclusions of the study, presents recommendations along with an implementation plan, and outlines the limitations of the study and the scope for future research.

1. Conclusion

The study examined the movement of Brent crude oil prices and the USD/INR exchange rate from July 2024 to June 2026 and evaluated their relationship and response during selected geopolitical events. The trend analysis indicates that Brent crude oil experienced a more pronounced decline during the earlier part of the study period, followed by stability and a sharp increase in early 2026. In comparison, the USD/INR exchange rate showed a more gradual movement with relatively smaller fluctuations.

The correlation analysis produced a coefficient of 0.20, indicating a weak positive linear relationship between Brent crude oil prices and the USD/INR exchange rate. This suggests that crude oil prices and the exchange rate were associated to some extent, but crude oil price movements alone do not explain the changes in the exchange rate.

The event analysis further indicates that major geopolitical developments were associated with fluctuations in both variables, with crude oil generally showing larger movements than the exchange rate. Overall, the study highlights that crude oil prices are one of several factors associated with movements in the Indian exchange rate,

while geopolitical and other economic and financial factors also need to be considered when examining USD/INR movements.

2. Recommendations and Implementation Plan

Recommendations

On the basis of the findings of the study, the following recommendations are made:

- Businesses and financial analysts should regularly monitor international crude oil price movements because significant fluctuations can affect the broader economic and financial environment.
- Exchange-rate analysis should consider factors such as inflation, interest rates, foreign capital flows, trade conditions and global financial movements along with crude oil prices.
- Businesses that depend heavily on imported crude oil should adopt appropriate risk-management practices to reduce the effect of sudden changes in crude oil prices and exchange rates.
- Geopolitical developments in major oil-producing regions should be monitored because such events can create volatility in international crude oil markets.
- Organizations can use monthly data dashboards and trend analysis to monitor Brent crude oil and USD/INR movements and identify significant changes.
- Future studies can use a longer study period and include additional economic variables to obtain a broader understanding of the relationship between crude oil prices and the Indian exchange rate.

Implementation Plan

Table 6: Implementation Plan for Recommendations

No.	Recommendation	Action to be taken	Responsible	Timeline
1	Monitor crude oil prices regularly	Track Brent crude oil price movements and review them in a periodic report	Businesses and financial analysts	Monthly
2	Consider wider determinants of the exchange rate	Include inflation, interest rates, capital flows, trade conditions and global financial movements in exchange-rate analysis	Financial analysts and researchers	With every analysis
3	Manage crude oil and exchange-rate risk	Adopt appropriate risk-management practices to reduce the effect of sudden changes in crude oil prices and exchange rates	Import-dependent businesses (finance and risk teams)	Short term; review quarterly
4	Monitor geopolitical developments	Follow developments in major oil-producing regions and assess their effect on oil and currency markets	Risk management teams and policy analysts	Continuous
5	Use dashboards and trend analysis	Set up monthly Excel / Power BI dashboards for Brent crude oil and USD/INR and track significant changes	Analysts and MIS teams	Set up in 1–2 months; update monthly
6	Extend future research	Use a longer study period and add further economic variables	Researchers	Long term



3. Limitations and Future Scope

Limitations of the Study

- The study is limited to Brent crude oil prices and the INR/USD exchange rate.
- The study uses secondary data, so the accuracy of the analysis depends on the reliability of the data sources.
- The study is limited to the selected two-year period and may not represent long-term trends.
- The INR/USD exchange rate is influenced by several factors other than crude oil prices, such as interest rates, inflation, foreign investment, U.S. dollar movements and monetary policy.
- The study considers only selected major geopolitical events and may not capture every event affecting oil and currency markets.
- The study uses monthly data, which may not capture short-term daily fluctuations in crude oil prices and exchange rates.

Future Scope

- Future studies can use a longer study period and include additional economic variables to obtain a broader understanding of the relationship between crude oil prices and the Indian exchange rate.
- Daily or other high-frequency data can be used to capture short-term movements in crude oil prices and exchange rates.
- Further econometric techniques such as regression, cointegration and causality tests can be applied to examine the direction and strength of the relationship.
- The study can be extended to other currencies or other oil-importing countries for a comparative analysis.

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