# INTERNATIONAL JOURNAL OF RESEARCH IN COMMERCE, ECONOMICS & MANAGEMENT

IJRCM


A Monthly Double-Blind Peer Reviewed (Refereed/Juried) Open Access International e-Journal - Included in the International Serial Directories

*Indexed & Listed at:*

Ulrich's Periodicals Directory ©, ProQuest, U.S.A., Cabell's Directories of Publishing Opportunities, U.S.A., Google Scholar, Indian Citation Index (ICI), J-Gage, India [link **of** the same is duly available at Inflibnet of University Grants Commission (U.G.C.)], Index Copernicus Publishers Panel, Poland with IC Value of 5.09 (2012) & number of libraries all around the world.

Circulated all over the world & Google has verified that scholars of more than **6408 Cities** in **196 countries/territories** are visiting our journal on regular basis.

Ground Floor, Building No. 1041-C-1, Devi Bhawan Bazar, JAGADHRI – 135 003, Yamunanagar, Haryana, INDIA

http://ijrcm.org.in/

# CONTENTS

# CALL FOR MANUSCRIPTS

We invite unpublished novel, original, empirical and high quality research work pertaining to the recent developments & practices in the areas of Computer Science & Applications; Commerce; Business; Finance; Marketing; Human Resource Management; General Management; Banking; Economics; Tourism Administration & Management; Education; Law; Library & Information Science; Defence & Strategic Studies; Electronic Science; Corporate Governance; Industrial Relations; and emerging paradigms in allied subjects like Accounting; Accounting Information Systems; Accounting Theory & Practice; Auditing; Behavioral Accounting; Behavioral Economics; Corporate Finance; Cost Accounting; Econometrics; Economic Development; Economic History; Financial Institutions & Markets; Financial Services; Fiscal Policy; Government & Non Profit Accounting; Industrial Organization; International Economics & Trade; International Finance; Macro Economics; Micro Economics; Rural Economics; Co-operation; Demography: Development Planning; Development Studies; Applied Economics; Development Economics; Business Economics; Monetary Policy; Public Policy Economics; Real Estate; Regional Economics; Political Science; Continuing Education; Labour Welfare; Philosophy; Psychology; Sociology; Tax Accounting; Advertising & Promotion Management; Management Information Systems (MIS); Business Law; Public Responsibility & Ethics; Communication; Direct Marketing; E-Commerce; Global Business; Health Care Administration; Labour Relations & Human Resource Management; Marketing Research; Marketing Theory & Applications; Non-Profit Organizations; Office Administration/Management; Operations Research/Statistics; Organizational Behavior & Theory; Organizational Development; Production/Operations; International Relations; Human Rights & Duties; Public Administration; Population Studies; Purchasing/Materials Management; Retailing; Sales/Selling; Services; Small Business Entrepreneurship; Strategic Management Policy; Technology/Innovation; Tourism & Hospitality; Transportation Distribution; Algorithms; Artificial Intelligence; Compilers & Translation; Computer Aided Design (CAD); Computer Aided Manufacturing; Computer Graphics; Computer Organization & Architecture; Database Structures & Systems; Discrete Structures; Internet; Management Information Systems; Modeling & Simulation; Neural Systems/Neural Networks; Numerical Analysis/Scientific Computing; Object Oriented Programming; Operating Systems; Programming Languages; Robotics; Symbolic & Formal Logic; Web Design and emerging paradigms in allied subjects.

Anybody can submit the **soft copy** of unpublished novel; original; empirical and high quality **research work/manuscript** ***anytime*** in ***M.S. Word format*** after preparing the same as per our **GUIDELINES FOR SUBMISSION**; at our email address i.e. infoijrcm@gmail.com or online by clicking the link **online submission** as given on our website (***FOR ONLINE SUBMISSION, CLICK HERE***).

# GUIDELINES FOR SUBMISSION OF MANUSCRIPT

1. **COVERING LETTER FOR SUBMISSION:**

**DATED: _____**

***THE EDITOR***

IJRCM

Subject: **SUBMISSION OF MANUSCRIPT IN THE AREA OF** _____.

**(e.g. Finance/Mkt./HRM/General Mgt./Engineering/Economics/Computer/IT/ Education/Psychology/Law/Math/other, please specify)**

**DEAR SIR/MADAM**

Please find my submission of manuscript titled '_____' for likely publication in one of your journals.

I hereby affirm that the contents of this manuscript are original. Furthermore, it has neither been published anywhere in any language fully or partly, nor it is under review for publication elsewhere.

I affirm that all the co-authors of this manuscript have seen the submitted version of the manuscript and have agreed to inclusion of their names as co-authors.

Also, if my/our manuscript is accepted, I agree to comply with the formalities as given on the website of the journal. The Journal has discretion to publish our contribution in any of its journals.

| | |
|---|---|
| **NAME OF CORRESPONDING AUTHOR** | : |
| Designation/Post* | : |
| Institution/College/University with full address & Pin Code | : |
| Residential address with Pin Code | : |
| Mobile Number (s) with country ISD code | : |
| Is WhatsApp or Viber active on your above noted Mobile Number (Yes/No) | : |
| Landline Number (s) with country ISD code | : |
| E-mail Address | : |
| Alternate E-mail Address | : |
| Nationality | : |

* i.e. Alumnus (Male Alumni), Alumna (Female Alumni), Student, Research Scholar (M. Phil), Research Scholar (Ph. D.), JRF, Research Assistant, Assistant Lecturer, Lecturer, Senior Lecturer, Junior Assistant Professor, Assistant Professor, Senior Assistant Professor, Co-ordinator, Reader, Associate Professor, Professor, Head, Vice-Principal, Dy. Director, Principal, Director, Dean, President, Vice Chancellor, Industry Designation **etc**. ***The qualification of author is not acceptable for the purpose***.

**NOTES**:

a) The whole manuscript has to be in ***ONE MS WORD FILE*** only, which will start from the covering letter, inside the manuscript. ***pdf. version is liable to be rejected without any consideration***.

b) The sender is required to mention the following in the **SUBJECT COLUMN of the mail**:

**New Manuscript for Review in the area of** (e.g. Finance/Marketing/HRM/General Mgt./Engineering/Economics/Computer/IT/ Education/Psychology/Law/Math/other, please specify)

c) There is no need to give any text in the body of the mail, except the cases where the author wishes to give any **specific message** w.r.t. to the manuscript.

d) The total size of the file containing the manuscript is expected to be below **1000 KB**.

e) Only the **Abstract will not be considered for review** and the author is required to submit the **complete manuscript** in the first instance.

f) ***The journal gives acknowledgement w.r.t. the receipt of every email within twenty-four hours*** and in case of non-receipt of acknowledgment from the journal, w.r.t. the submission of the manuscript, within two days of its submission, the corresponding author is required to demand for the same by sending a separate mail to the journal.

g) The author (s) name or details should not appear anywhere on the body of the manuscript, except on the covering letter and the cover page of the manuscript, in the manner as mentioned in the guidelines.

2. **MANUSCRIPT TITLE: The title of the paper should be typed in **bold letters**, **centered** and **fully capitalised**.

3. **AUTHOR NAME (S) & AFFILIATIONS: Author (s) **name**, **designation**, **affiliation** (s), **address**, **mobile/landline number** (s), and **email/alternate email address** should be given underneath the title.

4. **ACKNOWLEDGMENTS: Acknowledgements can be given to reviewers, guides, funding institutions, etc., if any.

5. **ABSTRACT: Abstract should be in **fully Italic printing**, ranging between **150** to **300 words**. The abstract must be informative and elucidating the background, aims, methods, results & conclusion in a **SINGLE PARA**. ***Abbreviations must be mentioned in full***.

6. **KEYWORDS: Abstract must be followed by a list of keywords, subject to the maximum of **five**. These should be arranged in alphabetic order separated by commas and full stop at the end. All words of the keywords, including the first one should be in small letters, except special words e.g. name of the Countries, abbreviations etc.

7. **JEL CODE: Provide the appropriate Journal of Economic Literature Classification System code (s). JEL codes are available at www.aeaweb.org/econlit/jelCodes.php. However, mentioning of JEL Code is not mandatory.

8. **MANUSCRIPT: Manuscript must be in ***BRITISH ENGLISH*** prepared on a standard A4 size ***PORTRAIT SETTING PAPER***. *It should be free from any errors i.e. **grammatical, spelling** or **punctuation.** It must be thoroughly edited at your end*.

9. **HEADINGS: All the headings must be bold-faced, aligned left and fully capitalised. Leave a blank line before each heading.

10. **SUB-HEADINGS: All the sub-headings must be bold-faced, aligned left and fully capitalised.

11. **MAIN TEXT**:

***THE MAIN TEXT SHOULD FOLLOW THE FOLLOWING SEQUENCE***:

**INTRODUCTION**

**REVIEW OF LITERATURE**

**NEED/IMPORTANCE OF THE STUDY**

**STATEMENT OF THE PROBLEM**

**OBJECTIVES**

**HYPOTHESIS (ES)**

**RESEARCH METHODOLOGY**

**RESULTS & DISCUSSION**

**FINDINGS**

**RECOMMENDATIONS/SUGGESTIONS**

**CONCLUSIONS**

**LIMITATIONS**

**SCOPE FOR FURTHER RESEARCH**

**REFERENCES**

**APPENDIX/ANNEXURE**

The manuscript should preferably be in ***2000 to 5000 WORDS***, But the limits can vary depending on the nature of the manuscript.

12. **FIGURES & TABLES:** These should be simple, crystal **CLEAR**, **centered**, **separately numbered** & self-explained, and the **titles must be above the table/figure**. **Sources of data should be mentioned below the table/figure**. *It should be ensured that the tables/figures are referred to from the main text*.

13. **EQUATIONS/FORMULAE:** These should be consecutively numbered in parenthesis, left aligned with equation/formulae number placed at the right. The equation editor provided with standard versions of Microsoft Word may be utilised. If any other equation editor is utilised, author must confirm that these equations may be viewed and edited in versions of Microsoft Office that does not have the editor.

14. **ACRONYMS:** These should not be used in the abstract. The use of acronyms is elsewhere is acceptable. Acronyms should be defined on its first use in each section e.g. Reserve Bank of India (RBI). Acronyms should be redefined on first use in subsequent sections.

15. **REFERENCES:** The list of all references should be alphabetically arranged. ***The author (s) should mention only the actually utilised references in the preparation of manuscript*** and they may follow Harvard Style of Referencing. **Also check to ensure that everything that you are including in the reference section is duly cited in the paper**. The author (s) are supposed to follow the references as per the following:

- All works cited in the text (including sources for tables and figures) should be listed alphabetically.
- Use (**ed.**) for one editor, and (**ed.s)** for multiple editors.
- When listing two or more works by one author, use --- (20xx), such as after Kohl (1997), use --- (2001), etc., in chronologically ascending order.
- Indicate (opening and closing) page numbers for articles in journals and for chapters in books.
- The title of books and journals should be in italic printing. Double quotation marks are used for titles of journal articles, book chapters, dissertations, reports, working papers, unpublished material, etc.
- For titles in a language other than English, provide an English translation in parenthesis.
- ***Headers***, ***footers***, ***endnotes*** *and* ***footnotes*** *should* ***not be used*** *in the document.* However, **you can mention short notes to elucidate some specific point**, which may be placed in number orders before the references.

**PLEASE USE THE FOLLOWING FOR STYLE AND PUNCTUATION IN REFERENCES:**

**BOOKS**

- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio" Ohio State University, Nigeria.

**CONTRIBUTIONS TO BOOKS**

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

**JOURNAL AND OTHER ARTICLES**

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

**CONFERENCE PAPERS**

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–23

**UNPUBLISHED DISSERTATIONS**

- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

**ONLINE RESOURCES**

- Always indicate the date that the source was accessed, as online resources are frequently updated or removed.

**WEBSITES**

- Garg, Bhavet (2011): Towards a New Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

# A COMPARATIVE STUDY BETWEEN THE VOLATILITY OF CRUDE OIL PRICE INDEX AND GASOLINE PRICE STOCK RETURNS

*A. CATHERINE MARY*
*FULL TIME RESEARCH SCHOLAR IN MANAGEMENT*
*SCHOOL OF YOUTH EMPOWERMENT*
*MADURAI KAMARAJ UNIVERSITY*
*MADURAI*

*Dr. A. VELANGANNI JOSEPH*
*PROFESSOR, HEAD & CHAIRPERSON*
*SCHOOL OF YOUTH EMPOWERMENT*
*MADURAI KAMARAJ UNIVERSITY*
*MADURAI*

**ABSTRACT**

*This paper analyzes the relationship between exchange rate Indian oil exchanges like Crude oil, Gasoline. It measures the impact of changes in exchange rate on Indian oil exchanges like Crude oil, Gasoline. Several statistical tests have been applied in order to measure the impact of exchange rate on Indian oil exchanges like correlation, t-test Multiple Regression Analysis, descriptive statistics, Skewness and Kurtosis. The period for the study has been taken (from October 2013 to May 2018) using daily closing price and daily price are converted in to monthly price. From the data analysis we found that the result of Correlation confirmed that there is negligible relation between Oil rate and Gasoline rate negligible relation between Exchange rate and Price.*

**KEYWORDS**

crude oil price returns, gasoline price index returns, implied volatility.

**JEL CODES**

C32, E44, G12, G15.

## INTRODUCTION

Crude oil Industry is considered to be the back bone of an economy, because this is the main source of energy till date. Any economy around the world would fail to precede a single step in the absence of crude oil industry including the refining of crude oil. The price of crude oil is determined by the demand, supply mechanism around the globe. Crude oil is not a domestic product and any kind of shortage in the same has serious ramifications on all possible industries along with the economies all over the world. Crude oil industry always needs to perform exploration research all over the world for finding more crude oil sites which also become instrumental in the setting up of crude oil industry.

## IN INDIA

India is one of the largest importers of oil and petrol in the world. Like many other Indian industries, the development of the Indian crude industry began very slowly. It started mainly in the northeastern part of Indian especially in the place called Digboi in the state of Assam. Until the 1970's the production of crude oil and the exploration of new location for extraction of crude oil were mainly restricted to the northeastern state in India. However, an important advancement in the Indian crude oil industry came with the passing of Industrial Policy Resolution in 1956, which emphasized focus on the growth and promotion of industries in India. The crude oil industry has contributed heavily to the manufacturing industry in the country through foreign trade in petroleum products. Rapid globalization, fast-changing technology, and the changing methods in the way business is conducted have brought significant changes and enormous opportunities for petroleum companies in India to flourish and expand their operation to global markets.

## IN GLOBAL

The global oil industry is a very complex industry. It is one of the oldest in the world as well as one that affects tremendously all aspects of business. Oil is a precious energy source that fulfills 40% of the global energy needs. The products of oil companies revolutionize daily life and the way we do things. Upstream and down-stream are two major sectors in the oil industry. In between, there is another sector namely the midstream. The midstream sector processes, stores, markets and transports commodities such as crude oil, petroleum, natural gas liquids as ethane, propane and butane. The upstream sector involves the processes of oil explo-ration and drilling. Over these years, because of technological advancement, oil producers have been able to access more deposits which resulted in an increase in reserves. The downstream sector involves refining, transporting and marketing of oil and oil products. At the production unit, it is processed and refined into different products that include gasoline, kerosene, residual fuel oil and asphalts.

The Indian Crude oil Industry was dependent from the very beginning on foreign capital, expert personnel, and technology, which led to the industry's globalization. Globalization entails and integration of the nations' economies through corporate investments, financial flow, and trade in goods and services between nations. The Indian Crude oil Industry's Globalization took place since foreign involvement in the various important stages such as production, refining, exploration, and transportation increased oil consumption. To encourage Indian Crude oil Industry globalization has offered the contract of discovered fields to foreign and private companies. The various companies that have helped in the globalization of the Indian Crude oil Industry are Enron Oil and Gas Company, Videocon Petroleum Ltd, Reliance industries Ltd, Rave Oil ltd, and Command petroleum.

The Indian government in an attempt to further boost the globalization of the Indian Crude oil Industry formed the Exploration Licensing Policy by which it tried to attract the foreign and Indian companies in production and exploration. The incentives that were declared by the government to encourage globalization and the Indian Crude oil Industry are that, on imports that were required for Crude oil Operations Customs duty would not have to be paid, state participation is not compulsory, no tax on the production of crude oil, provisions for liberal depreciation, tax holidays for seven years from the day that production starts, and the freedom to sell natural gas and crude oil in the domestic market at prices that are related to the market. The government of India has taken several measures in order to ensure that the Globalization of the Indian Crude oil Industry is successful for the industry.

## REVIEW OF LITERATURE

Jones and Kaul (1996) 98 tested whether the reaction of international stock markets to oil shocks can be justified by current and future changes in real cash flows and/or changes in expected returns. They found that aggregate stock market returns in the U.S., Canada, Japan and the U.K. were negatively sensitive to the

adverse impact of oil price shocks on those economies. From the data collected from 1970 to 1995 they used the GARCH and Granger causality test and argued that investors in stock markets under react to oil price changes in the short run. They concluded that in the postwar period, the reaction of U.S and Canadian stock prices to oil shocks can be completely accounted for by the impact of these shocks on real cash flows alone. In contrast, in both the United Kingdom and Japan, innovations in oil prices appear to cause larger changes in stock prices than can be justified by subsequent changes in real cash flows or by changing expected returns. Siliverstovs, Hegaret, Neumann and Hirschhausen (2005)99 investigated the degree of integration of natural gas markets and their relation to the oil price were explored through principal components analysis and Johansen likelihood-based co-integration procedure for Europe, North America and Japan markets for the period between the early 1990s and 2004. They found in both the analysis a high level of natural gas market integration within Europe, between the European and Japanese markets as well as within the North American market. At the same time, the obtained results suggested that the European and the North American as well as the Japanese and North American markets were not integrated, confirming with the earlier studies that the gas markets were not integrated across continents. Haesun, Mjelde and Bessler (2008)100 studied the relationships among eight North American natural gas spot market prices. The study provided a dynamic picture of daily information flow among natural gas spot markets from 1998 to 2007. The study used the error correction model (VECM) as the basic tool for analysis. Results indicated that the Canadian and U.S. natural gas market was a single highly integrated market. Further results indicated that price discovery tends to reflect both regions of excess demand and supply. Across North America, Malin Hub in Oregon, Chicago Hub, Illinois, West Texas Intermediate, Henry Hub and Louisiana region were the most important markets for price discovery. Opal Hub in Wyoming was an information sink in contemporaneous time, receiving price information but passing on no price information. Alberta Energy Company (AECO) Hub in Canada received price signals from several markets and passes on information to Opal and the Oklahoma region. Maslyuk and Smyth (2009)101 studied co-integration between oil spot and future prices of the same and different grade in the presence of structural change. The purpose of the study was to examine whether crude oil spot and futures prices of the same and different grades were co-integrated using a residual-based co-integration test that allows for one structural break in the co-integrating vector and high-frequency data. For the analysis, U.S. WTI (West Texas Intermediate) and UK Brent was chosen as the representative crudes since these two crudes have well-established spot and futures markets. The results revealed that spot and future prices of the same grade as well as spot and future prices of different grades were co-integrated. Matthew, Jian and Kuan (2009)102 examined whether Dubai crude oil and Brent crude oil futures prices were stationary as well as whether there exist a long-run equilibrium relationship in the oil markets. Further, they investigated the dynamic process of the endogenous variables and future periods through VECM. The study period was from January 3, 2000 through October 1, 2009 with a total of 2481 daily samples. They found that Brent crude oil prices lead Dubai crude oil prices.

Shaharudin, Samad, Fazilah, Bhat and Sonal (2009) examined the effect of oil prices movements on the stock price of oil and gas companies in three different markets (U.S., India ad UK) using daily data. The dynamic interaction between oil prices and stock prices was investigated in the presence of economic variables like interest rates and industrial productions. They collected the daily data for the period August 08, 2003 to August 8th, 2008. The oil price was the London Brent crude oil Index. The oil stocks included the Exxon Mobil and Chevron stocks from the NYMEX. Reliance Industries and Indian Oil Corporation Limited stocks were collected from the NSE of India and Royal Dutch Shell and Gazprom stocks from the LSE. They employed unit root tests, co-integration tests, variance auto regression, error-correction models with variance decomposition and impulse response and ARCH/GARCH models. The results suggested that there exists significant short run and long run relationship between oil price and the oil stocks including the effect of the other variables such as interest rate and the stock index. The oil price volatility transmission has a persistent effect on the volatility of the stocks of the oil companies in all the countries that were taken up for the study.

Pushpa, Chakraborty and Mathur (2011)108 investigated the existence of long term relationships between oil prices and stock market prices of two big emerging economies in Asia viz., India and China. Since India and China were the major oil consuming market, their stock markets were likely to be susceptible to oil price fluctuations. A data series from January, 2000 to May, 2011 was considered. The stationarity of the data series was checked using ADF Test. Johansen's co-integration model was applied to find out the co-integration among the oil prices and stock prices of India and China. VECM was employed to trace the existence of long run relationship between the variables109. The results of the co-integration analysis found the existence long-run relationship between oil prices and stock market prices for both the countries. The trace and maximum Eigen value test results also revealed the existence of unique co-integrating vectors between test variables. They provided evidence on the existence of at least one co-integrating vector in the model and therefore concluded that the variables exhibit a long-run association between them. 108 Pushpa Negi, Anindita Chakraborty and Garima Mathur. (2011). Long term price linkages b between them.

## OBJECTIVES OF THE STUDY

1. To measure the impact of crude oil price index future returns on the volatility of gasoline.
2. To examine the relationship between the crude oil price index future returns and gasoline.
3. To evaluate the persistence of stock price volatility in crude oil price index and gasoline.
4. To identify whether there is any relation between crude oil price index and gasoline.
5. To examine the predictive ability.

## NEED FOR THE STUDY

India is heavily dependent on crude oil and LNG imports with 82.8% import dependence for crude oil and 45.3% for natural gas/LNG. The net foreign exchange outgo is 63.305 million US$ in the financial year 2017-18 on account of crude oil imports. India generated 35.2 million tons of petroleum products from indigenous crude oil production whereas the consumption of petroleum products is 204.9 million tons. Similarly, India generated 31.7 bcm natural gas locally against the consumption of 58.1 bcm. LNG price is linked to the prevailing crude oil price in global markets.

India is the third biggest oil importer after US and China in 2017. In the year 2019, US is going to become net exporter of LNG, LPG, crude oil and its products from its shale oil production boom. Shale oil production cost would be the lower ceiling price for the crude oil in international trade as its substantial production is consumed internally in US.

Due to lack of adequate petroleum reserves, India has to depend mostly on crude oil imports in near future till its renewable energy resources such as solar, wind and bio-mass resources are exploited adequately to achieve energy security by replacing the petroleum products consumption which is also major contributor to the air pollution. In these adverse situation, India has to proactively play major role in global crude oil trade as swing oil producer by using its limited crude oil production base to bring down the high price of crude oil fixed by OPEC and the multinational crude oil production companies. International crude oil prices vary steeply for a small mismatch between global supply and global demand. To become swing oil producer, India should enhance crude oil extraction rate twice of the normally designed rate for continuous extraction from its developed oil fields and extract crude oil on intermittent basis only when crude oil prices exceed a preset upper ceiling value instead of continuously extracting oil.

Also, India and China being major oil importers, both countries should coordinate for mutual benefit while trading in global oil markets to moderate the crude oil price to nullify the oil pricing power of OPEC, etc. Normally, crude oil pricing and gold pricing exhibit opposite trends in global trading (i.e. while one appreciates the other depreciates). India should procure crude oil in futures market by hedging gold.

## RESEARCH HYPOTHESIS

Ho=There is no significant relationship between crude oil price index future and gasoline.

H1=There is significant relationship between crude oil price index future and gasoline.

## SCOPE OF THE STUDY

The study is conducted to understand the extent of relation between crude oil price index future and gasoline. Daily closing values of Crude oil Petroleum and Gasoline were taken to calculate return for the period from October 1st 2013 to May 31st 2018.Standard Deviation and Mean Returns are calculated to know volatility and returns in both the indices. Co-efficient of correlation is estimated to know the relation between crude oil price index future and gasoline. Descriptive

Statistics, for monthly returns of variables and stock market carried out to understand the significant of relation. Statistics of the monthly returns, mean, standard deviation, skewness and kurtosis are analyzed the study.

## RESEARCH METHODOLOGY

Daily returns of crude oil price index future and gasoline are calculated using daily closing values for period of year that is from October 1st 2013 to May31st2018.Mean, Standard Deviation and Skewness and kurtosis are estimated using excel. Correlation is estimated to understand the relation prevailing between crude oil price and gasoline index price in future.

## ANALYSIS

**TABLE 1: RESULTS OF DESCRIPTIVE STATISTICS FOR CRUDE OIL PRICE INDEX STOCK RETURNS DURING THE STUDY PERIOD FROM 01.10.2013 TO 31.5.2018**

| Descriptive Statistics | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Values** | **N** | **Minimum** | **Maximum** | **Mean** | **S.D** | **S.E** | **Skewness** | **Kurtosis** |
| **Crude Oil Price** | 57 | -100 | 18.24582 | 1.857 | 15.82877 | 2.09657 | -4.3613619 | 26.52964 |

The table 1 Displays the results of descriptive statistics for crude oil price during the study from 1.10.2013 to 31.5.2018. The results of minimum and maximum values of long run returns of oil price,were in the range of -100.00 to 18.2458 with an average return of-1.857there were variations in the crude oil price of different quarters during the study period. The Skewness and Kurtosis, which indicates, flatness (or) peakedness of data distribution revealed that an asymmetric distribution, with negative skewness and more peaked distribution (Lepto Kurtic), was for crude oil price during the study period.

**CHART 1**

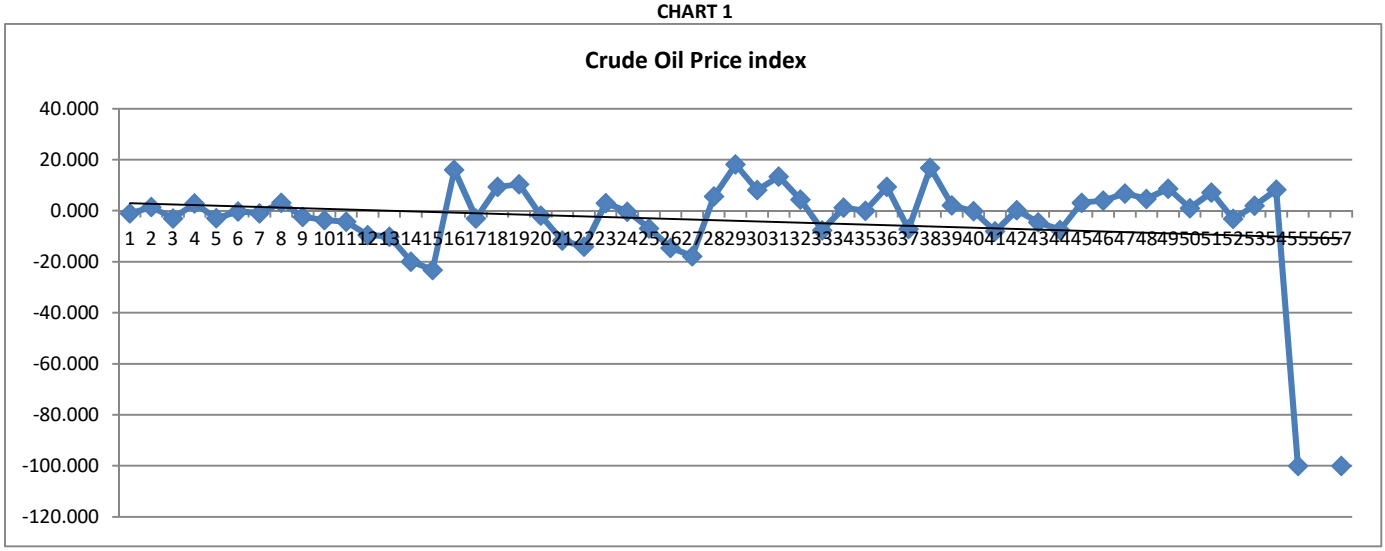



**TABLE 2: RESULTS OF DESCRIPTIVE STATISTICS FOR GASOLINE PRICE INDEX IN FUTURE STOCK RETURNS DURING THE STUDY PERIOD FROM 01.10.2013 TO 31.5.2018**

| Descriptive Statistics | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Values** | **N** | **Minimum** | **Maximum** | **Mean** | **S.D** | **S.E** | **Skewness** | **Kurtosis** |
| **Gasoline Price** | 57 | -100 | 19.5058 | 1.675 | 15.60448 | 2.066864 | -4.5426198 | 28.445834 |

The table 2 Displays the results of descriptive statistics for Gasoline Price index in future during the study from1.10.2013 to 31.5.2018. The results of minimum and maximum values of long run returns of gasoline price index, were in the range of -100 to 19.505 with an average return of -1.675. There were variations in the gasoline price index future of different quarters during the study period. The standard deviation which is volatility, was 15.60, an asymmetric distribution, with long tail towards left, was observed in gasoline price index future. The value of kurtosis was 0.00284, which indicated that the gasoline price index returns recorded platykurtic distribution during the study period.

**CHART 2**

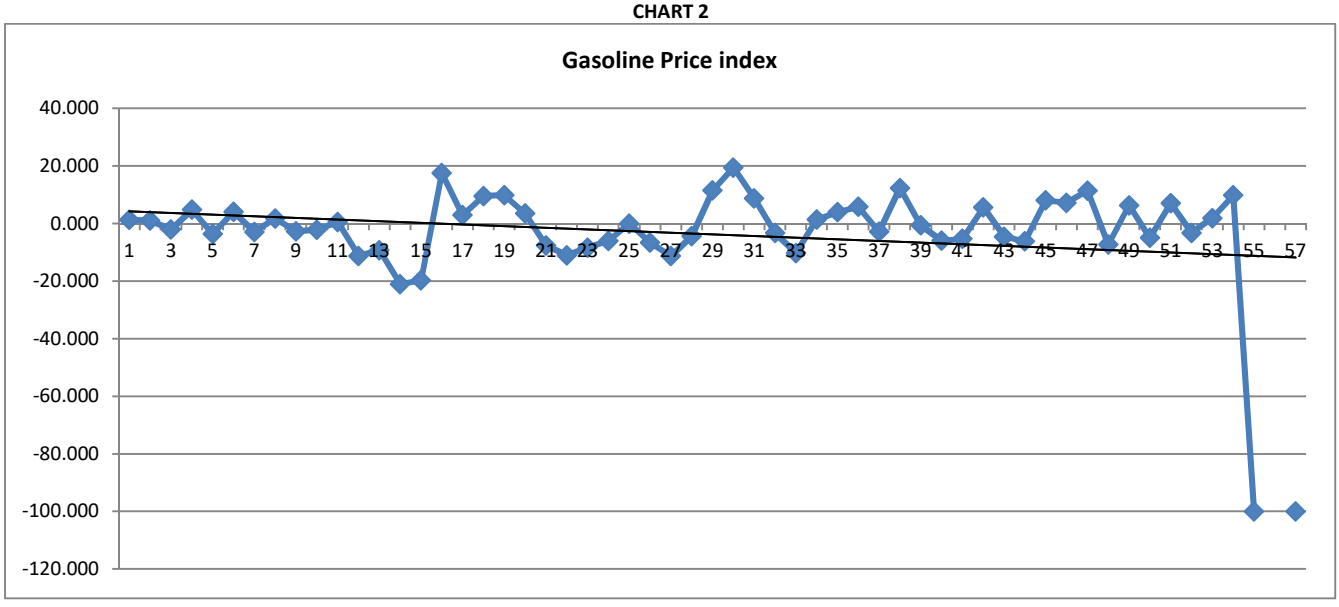


**TABLE 3: REGRESSION STATISTICS FOR 2013-2018**

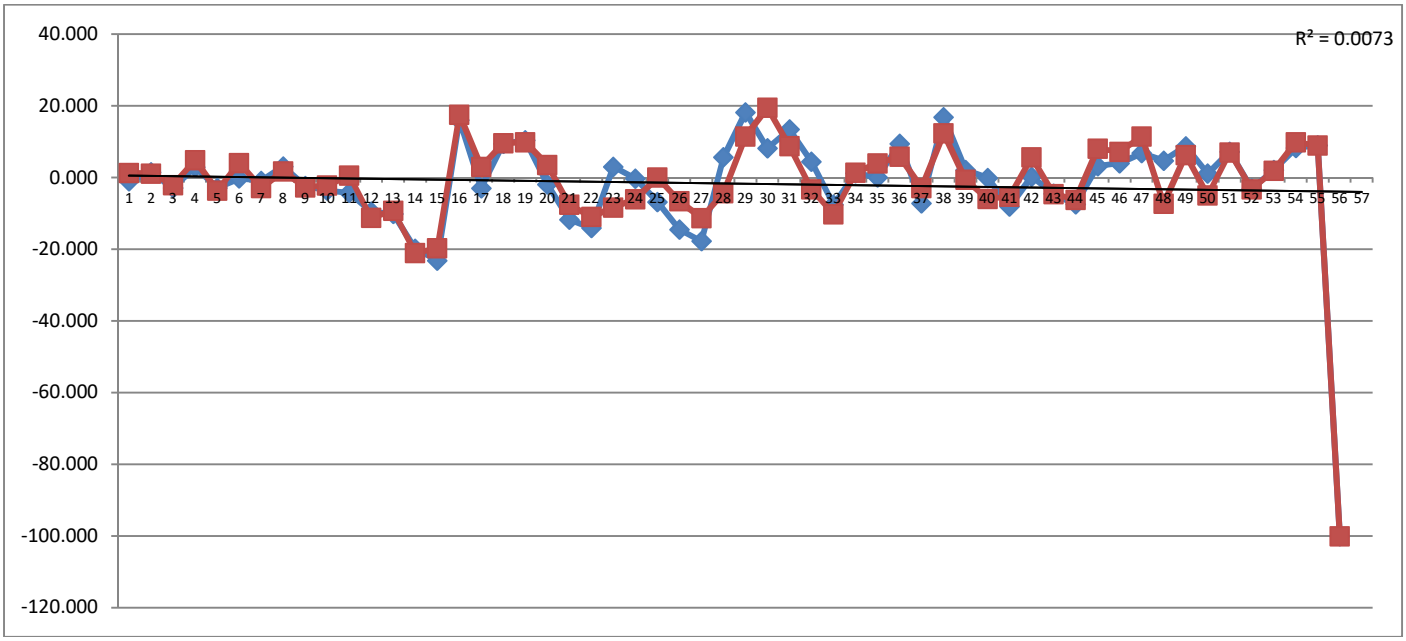
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **SUMMARY OUTPUT** | | | | | | | | |
| ***Regression Statistics*** | | | | | | | | |
| **Multiple R** | 0.955591674 | | | | | | | |
| **R Square** | 0.913155447 | | | | | | | |
| **Adjusted R Square** | 0.911576455 | | | | | | | |
| **Standard Error** | 4.640165217 | | | | | | | |
| **Observations** | 57 | | | | | | | |
| **ANOVA** | | | | | | | | |
| | ***df*** | ***SS*** | ***MS*** | ***F*** | ***Significance F*** | | | |
| **Regression** | 1 | 12451.78775 | 12451.78775 | 578.315485 | 7.31496E-31 | | | |
| **Residual** | 55 | 1184.212328 | 21.53113324 | | | | | |
| **Total** | 56 | 13636.00008 | | | | | | |
| | ***Coefficients*** | ***Standard Error*** | ***t Stat*** | ***P-value*** | ***Lower 95%*** | ***Upper 95%*** | ***Lower 95.0%*** | ***Upper 95.0%*** |
| **Intercept** | 0.073956467 | 0.618897316 | 0.119497153 | 0.90531692 | -1.166341461 | 1.314254396 | -1.16634146 | 1.314254396 |
| **X Variable 1** | 0.942051365 | 0.039173482 | 24.04819088 | 7.315E-31 | 0.863545954 | 1.020556777 | 0.86354595 | 1.020556777 |

**TABLE 4: SUMMARY RESULTS OF DESCRIPTIVE STATISTICS OF SAMPLE CRUDE OIL PRICE INDEX AND GASOLINE PRICE INDEX DURING THE STUDY PERIOD FROM 01.10.2013 TO 31.5.2018**

| Variables/Statistic | Minimum | Maximum | Mean | S.D | S.E | Skewness | Kurtosis | observations |
|---|---|---|---|---|---|---|---|---|
| **Crude Oil Price** | -100 | 18.24582 | 1.857 | 15.82877 | 2.09657 | -4.3613619 | 26.52964 | 57 |
| **Gasoline Price** | -100 | 19.5058 | 1.675 | 15.60448 | 2.066864 | -4.5426198 | 28.44583 | 57 |

The table 4 Provides the summary results of descriptive statistics, for the sample crude oil price index and gasoline price index variables, during the study period. It is clear that Minimum and Maximum values of the selected sample variables ranged from -100 to 18.24. Among all the sample crude oil price index and gasoline price index variables, the gasoline price index the highest average returns. However, crude oil price returns witnessed negative mean returns during the period. The Standard Deviation, which is an indication of volatility, was high for crude oil price index returns. The Skewness was negative for two sample variables.

**CHART 3: CRUDE OIL PRICE INDEX AND GASOLINE PRICE INDEX RETURNS:**




**t- Test Paired Two Samples For Means**

The **t-Test Paired Two Sample for Means** tool performs a **paired two-sample** Student's **t-Test** to ascertain if the null hypothesis (**means** of **two** populations are equal) can be accepted or rejected. This **test** does not assume that the variances of both populations are $d_z = \frac{\mu_1 - \mu_2}{\sigma_{x_1 - x_2}} \approx \frac{\bar{x}_1 - \bar{x}_2}{s_z}$ equal.... The result of this tool is a calculated **t**-value.

**TABLE 5: t-TEST PAIRED TWO SAMPLE FOR MEANS**

| t-Test: Paired Two Sample for Means | | |
|---|---|---|
| **A** | **B** | **C** |
| | **Crude Oil Price** | **Gasoline Price** |
| **Mean** | -1.857499976 | -1.675903921 |
| **Variance** | 250.5500626 | 243.5000015 |
| **Observations** | 57 | 57 |
| **Pearson Correlation** | 0.955591674 | |
| **Hypothesized Mean Difference** | 0 | |
| **df** | 56 | |
| **t Stat** | -0.292382183 | |
| **P(T<=t) one-tail** | 0.385537494 | |
| **t Critical one-tail** | 1.672522304 | |
| **P(T<=t) two-tail** | 0.771074987 | |
| **t Critical two-tail** | 2.003240704 | |

**Interpretation**

Table 5 Provides Cells B4 and C4 contain the mean of each sample, Variable 1 = Beginning and Variable 2 = End. Cells B5 and C5 contain the variance of each sample. Cells B6 and C6 contain the number of observations in each sample. Cell B7 contains the Pearson Correlation which indicates that the two variables are rather closely correlated. Cell B8 contains our entry for the Hypothesized Mean Difference. Cells B9 contain the degrees of freedom, 10 – 1. Cell B10 contains the result of the actual t-test. We will compare this value to the t-Critical two-tail statistic. Note: Use a one-tail test if you have a direction in your hypothesis, i.e. if testing that a value is above or below some level. In this example P(T <= t) two tail (0.7710)gives the probability that the absolute value of the t-Statistic (0.29) would be observed that is lesser in absolute value than the Critical t value (2.003). Since the p – value is less than our alpha, 0.05; we reject the null hypothesis that there is no significant difference in the means of each sample.

## FINDINGS

The empirical data analysis provided sufficient facts that stock market returns are negatively related with the India volatility index. The minimum and maximum values of selected sample variables ranged from -100.00. Among all the sample crude oil price index returns and gasoline price index returns variables recorded the highest average returns the crude oil price return the highest average returns. However, crude oil price returns witnessed negative mean returns during the period. The Standard Deviation, which is an indication of volatility, was high for crude oil price returns. The Skewness was negative for two sample variables. The kurtosis value was less than three for two sample variables. The Standard Deviation, which is an indication of volatility, was high for crude oil price returns than gasoline price. Skewness was negative for the sample of crude oil. kurtosis value was greater than gasoline price, which indicated leptokurtic distribution (more peaked than normal distribution).it is clear from the analysis of multiple regression indicated that none of the selected sample gasoline price returns influenced crude oil price. The results of during the study period Use a one-tail test if you have a direction in your hypothesis, i.e. if testing that a value is above or below some level. In this example P (T <= t) two tail (0.7710) gives the probability that the absolute value of the t-Statistic ((0.29) would be observed that is lesser in absolute value than the critical t value (2.003). Since the p – value is less than our alpha, 0.05; we reject the null hypothesis that there is no significant difference in the means of each sample.

## CONCLUSION

The oil and gas sector is fairly well developed in India, and is poised to contribute a large share to India's energy basket over the next 10 years. A conservative estimate of 7 per cent growth in the Indian economy is expected to approximately double India's per capital energy consumption over the next 20 years. Since energy demand and economic growth are almost interlinked, the Indian oil and gas sector, which provides the country with a significant portion of its energy requirements, has been identified as a key metric that will drive future GDP growth. To cope up with the increasing demand, the government has allowed 100 per cent FDI in the oil and gas sector, enabling some large partnerships such as the US$ 7.2 billion deal between BP and Reliance Industries. In order to further aid the development of the sector, the government introduces legislations such as the NELP to enable companies to bid for exploration rights, and encourage private sector participation. The participation of the private sector is expected to bring in monetary resources and technological capabilities, especially in the field of deep sea exploration while simultaneously reducing the dominance of PSUs in the country's competitive landscape. This year's Union Budget is expected to have a mixed impact on the sector, as the government has increased cess on crude oil production by approximately 80 per cent, thereby reducing its under recoveries. On the other hand, the government has also exempted the basic customs duty on the import of liquefied natural gas for power generation for two years, and made oil and gas pipelines eligible for viability gap funding, consequently aiding the midstream segment and thereby greatly benefiting the sector. The main future opportunities for the sector include assessing the feasibility of using non-conventional fuels such as coal bed methane, hydrogen and bio diesel. The sector must also lay greater focus on developing midstream infrastructure, with specific attention on city gas distribution networks, and the construction of strategic storage facilities as a safeguard against short term disruptions in fuel supply. The present study examined the relationship between crude Oil Price index future returns it is noted that there was no evidence of positive relationship between the dependent variables Gasoline Price and the independent variables during the study period. The results of correlation and causality analysis provided a different view. The Two variables are subjected to volatile pattern. However, the findings indicated that volatility was highly persistent in the returns.

## REFERENCES


1. Asche, F., Osmundsen, P., & Sandsmark, M. (2006). The UK market for natural gas, oil and electricity: are the prices decoupled?. The Energy Journal, 27-40.
2. Bachmeier, L. J., & Griffin, J. M. (2006). Testing for market integration crude oil, coal, and natural gas. Energy Journal, 27(2), 55–71. https://doi.org/10.5547/ISSN0195-6574-EJ-Vol27-No2-4
3. Brigida, M. (2014). The switching relationship between natural gas and crude oil prices. Energy Economics, 43, 48-55.
4. Brown, S. P., & Yücel, M. K. (2008). What drives natural gas prices?. The Energy Journal, 45-60.
5. Chedid, R., Kobrosly, M., & Ghajar, R. (2007). A supply model for crude oil and natural gas in the Middle East. Energy Policy, 35(4), 2096-2109.
6. Cong, R. G., Wei, Y. M., Jiao, J. L., & Fan, Y. (2008). Relationships between oil price shocks and stock market: An empirical analysis from China. Energy Policy, 36(9), 3544-3553.
7. Dr. Sarkar.A.N. (2008), "Energy Security: Changing Dynamics and Emerging Future Energy Issues". Hydrocarbon Asia vol. 18 (3), pp47-52.
8. Dr. Sarker, A.N. (2009), "Global Strategic Oil Reserve – A Prognostic Scenario Analysis", Vol.34, (4), pp20-34.
9. Economides, M. J., Oligney, R. E., & Lewis, P. E. (2012). US natural gas in 2011 and beyond. Journal of Natural Gas Science and Engineering, 8, 2-8.
10. Hamilton, J. D. (2003). What is an oil shock? Journal of Econometrics, 113(2), 363- 398.
11. Kilian, L., & Park, C. (2009). The Impact of Oil Price Shocks on the US Stock Market. International Economic Review, 50(4), 1267-1287.
12. Möbert, J. (2007). Crude Oil Price Determinants. Econstor Make Your Publication Visible.
13. Novotný, F. (2012). The Link Between the Brent Crude Oil Price and The Us Dollar Exchange Rate. Prague Economic Papers, 2, 2012, 220-232.
14. Papapetrou, E. (2001). Oil price shocks, stock market, economic activity and employment in Greece. Energy Economics, 23(5), 511-532.

# REQUEST FOR FEEDBACK

**Dear Readers**

At the very outset, International Journal of Research in Commerce, Economics & Management (IJRCM) acknowledges & appreciates your efforts in showing interest in our present issue under your kind perusal.

I would like to request you to supply your critical comments and suggestions about the material published in this issue as well as, on the journal as a whole, on our e-mail **infoijrcm@gmail.com** for further improvements in the interest of research.

If you have any queries, please feel free to contact us on our e-mail **infoijrcm@gmail.com**.

I am sure that your feedback and deliberations would make future issues better – a result of our joint effort.

Looking forward to an appropriate consideration.

With sincere regards

Thanking you profoundly

**Academically yours**

Sd/-
**Co-ordinator**

# DISCLAIMER

The information and opinions presented in the Journal reflect the views of the authors and not of the Journal or its Editorial Board or the Publishers/Editors. Publication does not constitute endorsement by the journal. Neither the Journal nor its publishers/Editors/Editorial Board nor anyone else involved in creating, producing or delivering the journal or the materials contained therein, assumes any liability or responsibility for the accuracy, completeness, or usefulness of any information provided in the journal, nor shall they be liable for any direct, indirect, incidental, special, consequential or punitive damages arising out of the use of information/material contained in the journal. The journal, neither its publishers/Editors/ Editorial Board, nor any other party involved in the preparation of material contained in the journal represents or warrants that the information contained herein is in every respect accurate or complete, and they are not responsible for any errors or omissions or for the results obtained from the use of such material. Readers are encouraged to confirm the information contained herein with other sources. The responsibility of the contents and the opinions expressed in this journal are exclusively of the author (s) concerned.

# ABOUT THE JOURNAL

In this age of Commerce, Economics, Computer, I.T. & Management and cut throat competition, a group of intellectuals felt the need to have some platform, where young and budding managers and academicians could express their views and discuss the problems among their peers. This journal was conceived with this noble intention in view. This journal has been introduced to give an opportunity for expressing refined and innovative ideas in this field. It is our humble endeavour to provide a springboard to the upcoming specialists and give a chance to know about the latest in the sphere of research and knowledge. We have taken a small step and we hope that with the active co-operation of like-minded scholars, we shall be able to serve the society with our humble efforts.

## *Our Other Journals*