Ilkogretim Online - Elementary Education Online, 2021; Vol 20 (Issue 1): pp. 4790-4803
http://ilkogretim-online.org
doi: 10.17051/ilkonline.2021.01.516

A Study On Commodity Market Volatality With Special Reference To Natural Gas

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ABSTRACT

According to reports, India currently accounts for 0.4 % of global natural gas reserves and approximately 1% of production. The main obstacles to creating gas demand and boosting gas consumption are domestic production difficulties, issues in the pricing and allocation of gas imperfect regulatory practices and inadequate infrastructure. Any investor or traders must certainly consider technical analysis as a tool whether to buy the stock at a particular point of time through it is fundamentally strong. The study is purely based on secondary sources available from the website. Meeting the world's energy demand in 2040 will require a diverse energy mix. Natural gas will be a major game changer with fewer emissions, flexibility and abundance. Growth in the natural gas market is become decreasing important in international trade, especially after the recent financialization in commodity markets. Motivated by the low volatility and time-varying nature in natural gas futures prices, understanding the pricing dynamics of natural gas is essential for risk management. Find week evidence of negative jumps in the natural gas market and lower jump intensity in a more volatile period. This result has important implications for many financial analysis and policy institutions that have used commodity futures prices to predict movements in spot prices.

INTRODUCTION

Commodity trading in India started much before it started in many other countries. However, years of foreign rule, droughts and periods of scarcity and government policies caused the commodity trading in India. Commodity trading was restarted in India recently. Today, apart from numerous regional exchanges, India has Five national commodity exchanges namely, multi commodity exchange (MCX), National commodity and derivatives

Exchange (NCDEX), Indian commodity Exchange (ICEX),National stock Exchange (NSE) and Bombay stock Exchange (BSE).The regulatory body was erstwhile Forward markets commission (FMC) which was set up in 1953. As of September 2015 FMC was merged with the Securities and Exchange Board of India, SEBI. After this merger SEBI has ordered to exit many commodity exchanges.

NEED FOR THE STUDY

The need for the study arises due to lack of knowledge about the commodity market. To know the impact of other markets on commodity market, it has become necessary to understand the trading of commodity market. Such an analysis would help investors to invest in commodity market. The problem faced by the investors in the market is to predict the price movement of the commodity and to take the right decision on when to enter and exit the market so as to make a maximum profit. As Natural gas commodities are their price prediction is a rigorous job. Thus, there is a need to study the present scenario of the performance of Natural gas in Indian commodity market. Commodity market trading has been for long looked up on as a very risky venture, and investors, especially retail small-time investors never looked at them as viable option. For long-term, equity shares have been the most preferable investment option. One of the most deterring aspects of investment in commodity market is the lack of proper knowledge and also the perceived risk associated with it. To know the impact of other markets on commodity market, it became necessary to understand the trading of commodity market. Such an analysis will help the investors to invest in commodity market. Thus, there is a need to study the present scenario of the performance of the energy commodities in Indian stock market

OBJECTIVES FOR THE STUDY:

- To examine the price fluctuations of Natural gas commodity in the Indian commodity market.
- To study the behavior of Natural gas commodity using various technical tools like Moving average, Candle stick and Bollinger bands.
- To study and analyze the commodity market with reference of natural gas

REVIEW OF LITERATURE

Mishra, V., & Smyth, R (2016) had conducted a study on "Are natural gas spot and futures prices predictable?"The first is: Can natural gas futures prices predict natural gas spot prices? The second is: Are natural gas spot and futures prices weak form efficient or can they be predicted based on examination of historical data? To answer these questions, we use daily data for Henry Hub natural gas spot and futures prices. Our answer to the first question is that natural gas futures prices do not predict the magnitude of future natural

gas spot prices any better than what would be predicted by a random walk model. This result has important implications for many financial analysts and policy institutions that have used commodity futures prices to predict movements in spot prices. The answer to the second question is that when we apply a unit root test that allows for heteroskedasticity and two structural breaks, natural gas spot and futures prices are predictable. We then simulate a contrarian trading strategy for spot and futures prices to show under what circumstances trading in spot and futures prices are also profitable.

Ergen, I., &Rizvanoghlu, I. (2016) had conducted a study on "Asymmetric impacts of fundamentals on the natural gas futures volatility: An augmented GARCH approach" We investigated the determinants of daily volatility for natural gas nearby-month futures traded on the NYMEX within a GARCH framework augmented with market fundamentals. Consistent with the previous literature, we found that volatility is much higher on the natural gas and crude oil storage report announcement days, on Mondays and during winters. We also confirmed that high volatility is associated with divergence of storage levels and temperatures from seasonal norms. The asymmetric impact of storage levels on volatility across different seasons is empirically investigated and documented. The mainstream finding in the literature that lower storage levels result in higher volatility is valid only during winter. At other times, it is actually higher storage levels causing higher volatility. Also, time to maturity effect is present only in winters. Additionally, weather shocks have asymmetric impact on volatility depending on the sign of the shock. Finally, we found that augmentation with market fundamentals improves the out-of-sample forecast accuracy of standard GARCH models.

Zhang, D., Shi, M., & Shi, X. (2018) had conducted a study on **"**Oil indexation, market fundamentals, and natural gas prices: An investigation of the Asian premium in natural gas trade" A heated debate has arisen over whether the Asian premium (i.e., higher prices in Asia than elsewhere) in natural gas trade is due to price discrimination or different market fundamentals. Determining the origin of this premium can help to guide the gas industries and policy makers in Asia, especially when the traditional oil-indexed price mechanism fades away. Using a new systemic time-series approach, this paper explores the extent to which oil prices and market fundamentals contribute to variations in gas prices in Japan, the United States, and Germany. We find clear cross-country differences and time-varying patterns. Gas prices are much less affected by supply and demand factors than oil prices in Japan and Germany, whereas these factors are more important than oil prices in the US market, which has a pricing hub.

Li, B. (2019) had conducted a study on "Pricing dynamics of natural gas futures" Growth in the natural gas market is pronounced since the shale gas boom. Natural gas has become increasingly important in international trade, especially after the recent financialization in commodity markets. Motivated by the high volatility and time-varying nature in natural gas futures prices, understanding the pricing dynamics of natural gas is essential for risk management. In this paper, we adopt a class of computationally efficient discrete-time pricing models and construct futures dynamics by differentiating three subsamples which represent time-varying market conditions. We find strong evidence of positive jumps in the natural gas market and higher jump intensity in a more volatile period. The dynamic jump intensity model has a better model fit both in-sample and out-of-sample, suggesting time-varying jumps are necessary for pricing natural gas derivatives.

Nakajima, T., & Toyoshima, Y. (2020) had conducted a study on "Examination of the Spillover Effects among Natural Gas and Wholesale Electricity Markets Using Their Futures with Different Maturities and Spot Prices" This study measures the connectedness of natural gas and electricity spot returns to their futures returns with different maturities. employ the Henry Hub and the Pennsylvania, New Jersey, and Maryland (PJM) Western Hub Peak as the natural gas price indicator and the wholesale electricity price indicator, respectively. We also use each commodity's spot prices and 12 types of futures prices with one to twelve months maturities and realize results in fourfold. First, we observe mutual spillover effects between natural gas futures returns and learn that the natural gas futures market is integrated. Second, we observe the spillover effects from natural gas futures returns to natural gas spot returns (however, the same is not evident for natural gas spot returns to natural gas futures returns). futures markets have better natural gas price discovery capabilities than spot markets. Third, observe the spillover effects from natural gas spot returns to electricity spot returns, and the spillover effects from natural gas futures returns to electricity futures returns.

RESEARCH METHODOLOGY

The Research design is Quantitative research because the data related to measurement, frequency of occurrences and prediction of future movement. Natural gas has been selected as the sample in the Commodity Market. The period of study is from 2016-2020 has been taken into consideration**.** In order to identify and analyse the determinants, this study is based on the Secondary data. The study is an analytical research because the research is based on secondary data analysis and the data have collected from investing.com and moneycontrol.com

TOOLS AND INDICATORS USED

Moving average, Candle stick and Bollinger bands.

LIMITATIONS OF THE STUDY

- Research is conducted considering only the yearly wise data. So we can't accurately identify the fluctuation in the market.
- Study is confined only to the commodity market in Indian context.
- The analysis of investment was mainly based on historical data.
- There is no guarantee that what happened in the past will continue in the future.

DATA ANALYSIS AND INTERPRETATION

MOVING AVERAGE

TABLE SHOWING THE MOVING AVERAGE OF NATURAL GAS

MONTH	OPENING PRICE	HIGHEST PRICE	LOWEST PRICE	CLOSING PRICE	MOVING AVERAGE
Jan-16	186.6	207.4	164.6	168.4	
Feb-16	168	189.3	160	167.7	
Mar-16	169	184.2	164.7	167	167.7
Apr-16	166.1	178.5	155.4	175.6	170.1
May-16	174.5	198.3	169.5	169.8	170.8
Jun-16	169	189.8	165	179.9	175.1
Jul-16	180.3	188.2	168.4	174.8	174.83
Aug-16	176.2	191.3	174.3	178.7	177.8
Sep-16	179.3	185.8	165.7	166.7	173.4
Oct-16	167	167.6	127	152	165.8
Nov-16	150.3	162	136.3	150.3	156.33
Dec-16	149.5	160.2	114.2	115.9	139.4
Jan-17	155.3	165.7	138.5	155.9	140.7
Feb-17	155	155	116.5	118.1	129.96
Mar-17	118.2	134.4	109	129.9	134.63
Apr-17	130.2	147.9	126.1	143.8	130.6
May-17	143	155.6	131.8	155	142.9
Jun-17	154.1	201.4	153.8	197.3	165.36
Jul-17	198.2	200.9	176.6	192.9	181.73
Aug-17	191.5	197.8	169.3	194.4	194.86

Sep-17	193.1	207.6	177.5	194	193.76
Oct-17	194.2	225.2	175.5	204.1	197.5
Nov-17	203.5	233	170.9	229.6	209.23
Dec-17	227.7	264.1	221.1	252	228.56
Jan-18	252.1	254.2	211.6	212.8	231.46
Feb-18	212.5	218.8	169	185	216.6
Mar-18	185.5	211.4	183	205.8	201.2
Apr-18	207.9	217.5	195.5	212.1	200.96
May-18	211.7	220	198.2	198.6	205.5
Jun-18	199.8	202.2	184.3	193.8	201.5
Jul-18	192.7	200.8	179.3	180	190.8
Aug-18	181.5	195.4	176.1	194.8	189.53
Sep-18	195.2	203.9	1585.1	198.4	191.06
Oct-18	196.2	200.1	185.2	187.8	193.66
Nov-18	188.3	212	180.4	197.1	194.43
Dec-18	197.6	202	164.7	189.7	191.53
Jan-19	191.4	203.5	174.8	190.5	192.43
Feb-19	191.1	191.1	162.5	175.9	185.36
Mar-19	175.1	183	166.7	179.4	181.93
Apr-19	178.5	191	171.6	183.8	179.7
May-19	185	203.4	181.1	199.5	187.56
Jun-19	199.1	209	192.7	200.8	194.7
Jul-19	200	200.8	186.8	192.8	197.7
Aug-19	192.3	209.4	188.4	206.9	200.17
Sep-19	206.2	226.3	198.7	218	205.9
Oct-19	219.7	250.8	219.7	214.6	213.17
Nov-19	242	358.7	230.7	317.4	250
Dec-19	312	335.4	211.6	212.2	248.07
Jan-20	204.3	264.4	199.2	201.5	243.7
Feb-20	202.2	203.7	181.8	199.7	204.47
Mar-20	199	205.5	186.4	186.7	195.97
Apr-20	186.8	190.5	170.7	180.8	189.07
May-20	179.7	188.7	171.9	172.3	179.93
Jun-20	172.9	172.9	150.7	160.5	171.2
Jul-20	161.5	170.6	145.5	155.1	162.63
Aug-20	154.8	166.4	144.6	165.1	160.23
Sep-20	168.1	194.9	105.6	165.8	162

Oct-20	166	194.8	156	187	172.63
Nov-20	187.9	205.9	166.7	167.2	173.33
Dec-20	169.2	180.5	154.2	155.5	169.9

INTERPRETATION:

The above table shows that 5 years moving average of Natural gas. The Moving Average method helps to know the trends in price moment of natural gas. In above table 5 years moving average calculated by using formula Average=Add 3mouth closing price/3 Under this moving average method helps to investor know price is going growth or not. From January 1st 2016 to December 31st 2020 we can see that the moving average of Natural gas has been increased and gradually decreased from November 2016 slowly. Again in the year 2017 gradually increased so, it is giving clear picture of future movement of the scrip. If the moving average crossing 200 days it means there is a strong buying in the market and it means the market is bullish trend. This table provides a message to the investor that it is a right time to buy or sell the commodity of natural gas

Moving Average for 2016 to 2020

CANDLE STICK PATTERNS:

INTERPRETATION:

In the above candle stick chart it is to be summarized that the price moment of natural gas is high in June 2016 with the price of 325.05 and the natural gas is low in December 2019 with the price of 124.30 so, the price moment of natural gas is going to be in upward trend in the upcoming period.

BOLLINGER BANDS

INTERPRETATION:

The Bollinger bands values of the natural gas are calculated for the year 2016 to 2020. The width between upper and lower band refers to the volatility of the prices of the commodity,

the higher the width the greater the volatility and in such a case it is advisable to sell the commodity and when there is low volatility, the investor either buy or retain the commodity. If the closing prices touch the upper Bollinger band, then the commodity is overbought and if the prices touch the lower Bollinger band, then the commodity is oversold in the market. It is advisable to buy the commodity when the closing prices hits the upper band and to sell when the prices hits the lower band. In 2017, the closing price touches the upper band and the commodity is overbought. In 2020, the closing price touches the lower band and the commodity is oversold. As per Bollinger bands natural gas is taking support round 159 levels and reach up to 207 and further up trends we can find out through envelop pattern.

ENVELOP (30%)

INTERPRETATION:

Envelopes are technical indicators that are typically plotted over a price chart with upper and lower bounds. The most common example of an envelope is a moving average envelope, which is created using two moving averages that define upper and lower price range levels. If prices moves 30% the target could be 207.30

ENVELOP **(40%)**

INTERPRETATION:

Envelopes are technical indicators that are typically plotted over a price chart with upper and lower bounds. The most common example of an envelope is a moving average envelope, which is created using two moving averages that define upper and lower price range levels. If a price moves 40% the target could be 223.30

ENVELOP (50%)

INTERPRETATION:

Envelopes are technical indicators that are typically plotted over a price chart with upper and lower bounds. The most common example of an envelope is a moving average envelope, which is created using two moving averages that define upper and lower price range levels. If prices moves 50% the target could be 239.30.

SUGGESTIONS FOR THE STUDY

- Before investing in the market, the investor should have clear knowledge of capital market. So it is the part of the company to educate the investor with relate to all the types of investment alternatives available.
- As the long term investment is more favor to the company as it can enjoy the benefit of long term cash reserve the marketer should try to push and pull more and longer term investment from the investors.
- Creating customer friendly application and website for users to have transparency in trading.
- Provision of webinar sessions for the investors should be performed for having loyal investors for long terms.
- Also it is necessary to keep in mind that only maintaining more and more fund reserve only should not be the sole objective of the company, it should predict the

future changes in the value of money, by changing its mind set the company should also play the role of fund creator.

CONCLUSION

As we all know India is one of the fastest growing economies in the world. Today, the health of stock market and commodity market is solely dependent on the pattern of investment by the investors. The last five years price movements of natural gas commodity with respect to Sensex again proves the existing literature which says the commodity market and stock markets are negatively correlated and they move in opposite direction. The correlation between commodities and BSE Sensex are negative for the period. The betas of commodities with respect to Sensex are also negative to conclude as the stock market and commodity market returns are negatively correlated and these two are a very good combination for investor's portfolio construction to build optimal portfolio with good returns and less risk. . An investor can succeed in his investment only when he is able to select the right commodities at right time. The investors should keenly watch the situation like market price, economy, returns, and the risk involved in a commodities before taking decision on a particular commodity.

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