

Commodity Price Movements - An Analysis

Dr. S. Krishnaprabha

Associate Professor, Department of Management Studies, Sri Ramakrishna Engineering College, Coimbatore, India

Abstract: The objective of this study is to determine the risk and return and analysing the market price for particular products in commodity market (gold, silver, aluminium, copper, natural gas, zinc, nickel, crude oil). 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. This study made will help the investors know the commodity market and technical analysis thus can succeed in the market.

Key words: Risk, Return, Correlation, Standard deviation, Variance, ROC, RSI.

I. INTRODUCTION

Commodity Market

A **commodity market** is a market that trades in primary economic sector rather than manufactured products. Soft commodities are agricultural products such as wheat, coffee, Cocoa and sugar. as wheat, coffee, cocoa and sugar. Hard commodities are mined, such as gold and oil. Investors access about 50 major commodity markets worldwide with purely financial transactions increasingly outnumbering physical trades in which goods are delivered. Futures contracts are the oldest way of investing in commodities. Futures are secured by physical assets

Commodity Market is a physical or virtual marketplace for buying, selling and trading raw or primary products. For investors' purposes there are currently about 50 major commodity markets worldwide that facilitate investment trade in nearly 100 primary commodities. Commodities are split into two types: Hard and Soft commodities. Hard commodities are typically natural resources that must be mined or extracted (gold, rubber, oil, etc.), iron ore, crude oil, coal, salt, sugar, coffee beans, soybeans, aluminium, copper, rice, wheat, gold, silver, palladium, and platinum, whereas soft commodities are commodities that are grown includes agricultural products or livestock (corn, wheat, coffee, sugar, soybeans, pork, etc.). There is another important class of energy commodities which includes electricity, gas, coal and oil. Electricity has the particular characteristic that it is either impossible or uneconomical to store; hence, electricity must be consumed as soon as it is produced.

II. REVIEW OF LITERATURE

Dr. Shree Bhagwat (2015)^[3] had conducted a study on "Commodity Exchanges in Commodity Markets of India: An Analytical Study of National Commodity Exchanges" commodity exchange in Indian mainly trade bullion, huge

metals, energy and agricultural produced. Unlike developed countries, foreign currency and stock indices are not part of our commodity market and are unlikely to be integrated in near future. Commodity exchanges provides electronic platform for seller and buyers to trade in multiple options available. The present study is an investigation into the present status, growth and developmental policy alternatives for commodity exchanges in India

Nilajana kumari (2014)^[4], had conducted a study on "Recent Trends in Commodity Markets of India" The study undertaken below has been outlined on the theme of the commodity markets functioning in India. The paper has been divided into four parts: Overview of the commodity market, sector-wise commodity market development, initiatives in the form of developmental activities undertaken by the Government of India, challenges faced by the commodity market. India is one of the top producers of a large number of commodities ranging from agricultural to non-agricultural products, with a long history in its trading market.

Mr. P.Periasamy, Dr. R. Satish(2014)^[5], had conducted a study on, " A Study on Commodity Derivative Market of Selected Non-Agricultural Products (Gold, Crude Oil, Copper) in the Chennai Market- An Analysis" explains the price volatility among selective nonagricultural commodities in Chennai commodity market. and analyze the future price movements of gold, Crude oil, Copper market trends using past data in Chennai commodity market. and find out the reasons for real price volatility among the selective nonagricultural commodities in Chennai commodity market.

Mr. Rohit Bansal, Varsha Dadhich, (2014)^[6], had conducted a study on, "Indian Commodity Market- A Performance Review". The study discusses the evolution and performance of the market, its present status and the future prospect. The purpose of futures commodity exchanges as a market place is to enable commodity Producers and processors to sell their produce in advance to protect them against possible price fall for their commodities and allow consumers, traders, processors to buy in advance to protect against possible price increase.

Ahmed Imran Hunjra, (2011)^[7], had conducted a study on "Risk and Return Relationship in Stock Market and Commodity Prices" is to determine the risk and return relationship on the basis of univariate modeling approach. This study is helpful to analyze the asymmetric nature of data including the seasonal affect and non linear properties in risk and return relationship scenario. In this study, monthly data was used regarding gold price, cotton prices and sugar price

along with KSE 100 index. The data span of all variables cover the time period from July 1998 to July 2008.

Bhaskar Goswami, Isita Mukherjee (2015)^[8], had conducted a study on, “Risk-Return Analysis of Different Commodity Futures in Indian Derivative Market” had provides a comparative analysis of risk-return on different groups of commodity futures and the groups are Agricultural commodity futures, Metals, Energy and Oil & Oil related commodity futures. The study compares the risk & return performance of different groups of commodity futures in India over the study period 2004-2012. All the forms of returns (nominal, real and excess) are greater for oil & oil related products. At the same time, the volatility component is also higher for this group compared to other group of commodity futures. For this group of commodity futures, the best (worst) performance is in the year 2010 (2012).

R. Chakrapani (2012)^[9], had conducted a study on, “A Study on Forecasting Predicting Commodity Prices Of Gold Movements With Use Of Holt-Winter Model Trend Smoothing Method At Hyderabad Stock Exchange”. This study examines the Trend in the Gold prices for a decade long period beginning from 1997 to 2007. This study also examined exponential smoothing as an effective forecasting technique. To assess the validity of these techniques, data were collected from gold.org for a period of ten years. All these data were analyzed using both the techniques.

III. RESEARCH METHODOLOGY

A. Type of research: The study is descriptive in nature

B. Tools for Data collection: The data is collected from secondary source for a time period of last three year from the MCX website. Sampling method is Sensex sample because all commodities selected from the Sensex

C. Tools for analysis: Beta, Return, Variance, ROC, RSI, Standard Deviation, Correlation

D. Sample

The sample size is number of the commodity products taken as 10 in the commodity market

E. Objective of the study

- To analyse the risk and return of the selected commodities
- To analyse the future price movement of commodities by using technical tools

IV. ANALYSIS AND INTERPRETATION

A. Risk

Investment is a measure of the risk arising from exposure to general market movements.

One percent change in market index return causes exactly one per cent change in the stock return. It indicates that the stock moves in tandem with the market.

$$\beta = \frac{n \sum xy - (\sum x)(\sum y)}{n \sum x^2 - \sum x^2}$$

1. One percent change in market index return causes 2% change in the stock return. The stock return is more volatile. When there is a decline of 10% in the market return, the stock with a beta of 2 would give a negative return of 20%. The stocks with more than 1 beta value are considered to be risky.

2. One percent changes in market index return causes 0.5% change in the stock market. The stock is less volatile compared to the market.

B. Return

The return can be calculated over a single period or where there is more than one time period, the return and rate of return over the overall period can be calculated, based upon return within each sub period.

$$R = (\text{Closing price} - \text{Opening price}) / \text{Opening price} * 100$$

Table 1: Risk and Return Analysis of Automobile sector

Commodity	Return(%)	Risk(Beta-β)
Gold	0.3	0.03
Silver	2.39	-0.2
Aluminium	1.88	0.01
Copper	-0.9	-0.02
Natural gas	1.31	-0.41
Zinc	-1.04	0.6
Nickel	0.37	1.10
Crude oil	1.02	0.16

It is inferred from the above table that in SILVER 1% change in market index return causes exactly -0.4% change in the commodity futures. It indicates that the scrip moves in tandem with the market. In 1% change in market index return causes exactly 1.01% changes in the commodity futures. It indicates that the scrip moves in tandem with the market

C. Standard Deviation

It is measure of the values of the variables around its mean or it is the squared deviation from the variance divided by the number of observances.

D. Variance

The variance is a parameter that describes, in part, either the actual probability distribution of an observed population of numbers or sample of numbers has been drawn

Table 2: Variance and Standard deviation

Commodity	Variance	Standard deviation
Gold	1.02	1.01
Silver	2.15	1.46
Aluminium	1.13	1.06
Copper	1.26	1.12
Natural gas	6.31	2.51
Zinc	8.16	2.85
Nickel	2.50	1.58
Crude oil	3.92	1.98

It is inferred from the above table that in ZINC the standard deviation is 2.85 that means the values in the data set are farther away from the mean and in GOLD the standard deviation is 1.01 that means the value in a data set are close to the mean of the data.

E. Correlation

Correlation is a statistical relationship between two random variables or two sets of data. Correlation refers to any of a broad class of statistical relationship involving dependence. The strength of the linear association between two variables is quantified by the correlation coefficient.

Correlation (Pearson (r) value Indicates)

- r is close to 1** – There is strong relationship between two variables. This means that changes in one variable are strongly correlated with change in second variable.
- r is close to 0** – There is weak relationship between two variables this means that change in one variable

are not correlated with change in the second variable. If Pearson r were 0.01, we conclude that our variables were not strongly correlated.

- r is Positive (+)** – One variable increase in value, the second variable decreases in value. Similarly, as one variable decreases in value. This is called a positive correlation.
- r is negative (-)** – One variable increases in value, the second variable decreases in value. This is called a negative correlation.

Table 3: Correlation between market returns and commodities returns

Commodity	r	Commodity	r
Gold	0.995	Natural gas	0.997
Silver	0.997	Zinc	-0.560
Alumn.	0.995	Nickel	0.998
Copper	0.998	Crude oil	0.999

From the above table it is inferred that the Crude oil and Copper is 0.999, so there is strong relationship between Commodities return and Market index and in Zinc -0.56, so there is no relationship between Commodities return and Market index

F. ROC (Rate of Change)

It measures the rate of change between current price and the price n number of days in past. ROC to find out the overbought oversold position in a scrip. ROC indicator was used to identify short term oversold and overbought levels as a chance to partake in the bigger uptrend. A more volatile stock may use -15% for oversold, while a less volatile stock may use -5%. $ROC = \frac{\text{Today's Price} - \text{Price } n \text{ Days back}}{10}$

Table 4: The Rate of Change in Commodity products

Date	7 days of Rate of Change							
	Gold	Silver	Aluminium	copper	Natural gas	zinc	Nickel	Crude oil
18-Jan-18	0.02	0.004	0.04	0.02	-0.02	0.03	-1.08	-0.009
17-Jan-18	0.02	0.03	0.05	0.02	-0.01	0.03	-1.05	-0.01
16-Jan-18	0.02	0.03	0.03	0.04	0.0003	0.06	-1.008	-0.01
13-Jan-18	0.02	0.01	0.03	0.05	0.01	0.08	-0.89	-0.01
12-Jan-18	0.01	0.01	0.02	0.06	0.02	0.06	-0.9	-0.0003
11-Jan-18	0.02	0.01	0.003	0.03	0.0009	0.07	-0.8	-0.03

10-Jan-18	0.01	0.04	0.01	0.04	-0.0002	0.06	-0.87	-0.02
09-Jan-18	0.01	0.05	-0.01	0.02	0.009	0.02	-0.8	0.02
06-Jan-18	0.001	0.02	-0.01	0.01	0.02	0.02	-0.87	0.03
05-Jan-18	0.01	0.02	-0.01	0.003	-0.01	0.05	-0.8	0.01
02-Jan-18	0.02	0.05	0.03	0.03	0.03	-0.01	-0.9	0.01

G. RSI (Relative Strength Index)

It is a oscillator used to identify the inherent technical strength and weakness of a particular scrip or market. RSI can be calculated for a scrip by adopting the following formula.

RSI is considered overbought when above 70 and oversold when below 30. Signals can be generated by looking for divergences, failure swings and centerline crossovers. RSI can also be used to identify the general trend. $RSI = 100 - (100 / (1 + R_s))$

Table 4.4 The Relative Strength Index of Commodity Products

Date	Relative Strength Index							
	Gold	Silver	Aluminium	Copper	Natural gas	Zinc	Nickel	Crude oil
18-Jan-18	103.9	0	27.78	27.67	64.93	64.58	60.56	65.83
17-Jan-18	92.08	89.62	21.83	23.65	55.77	56.36	42.57	42.34
16-Jan-18	93.75	110.68	61.15	60.76	70.12	77.84	78.72	75.16
15-Jan-18	88.14	119.28	65.86	63.18	79.9	78.74	83.36	77.79
14-Jan-18	83.51	134.48	44.73	44.76	50	52.74	63.01	62
11-Jan-18	80.95	140	33.97	31.4	40.57	38.36	49.48	49.72
10-Jan-18	79.75	156.41	32.07	29.8	39.45	34.27	48.43	50.19
9-Jan-18	72.13	173.33	26.01	26.34	31.15	27.89	42.14	41.63
8-Jan-18	87.14	116.92	25.97	24.18	35.11	32.56	45.25	46.31
6-Jan-18	80.43	134.21	6.35	0	20.73	9.84	17.25	11.54
5-Jan-18	86.05	145.71	4.07	6.71	7.14	8.42	18.54	24.27
4-Jan-18	120	392.31	5.67	9.2	8.77	9.09	28.8	33.4
3-Jan-178	60.82	290	29.28	27.52	23.63	21.56	53.75	57.52
2-Jan-18	105.8	527.27	29.61	27.19	43.84	44.83	46.49	49.33

V. CONCLUSION

The risk and return analysis on commodity products in commodity market. 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. This study made will help the investors know the commodity market and technical analysis thus can succeed in the market.

REFERENCES

Books

- [1]. Punithavathy Pandiyan “Security Analysis and Portfolio Management” Vikas publishing Pvt Ltd.
- [2]. S. Kevin “Security Analysis and Portfolio Management” PHI learning Pvt Ltd, New Delhi.

Journals

- [3]. **Dr. Shree Bhagwat (2015)** had conducted a study on “Commodity Exchanges in Commodity Markets of India: An Analytical Study of National Commodity Exchanges

- [4]. **Nilajana kumari (2014)**, had conducted a study on “Recent Trends in Commodity Markets of India.
- [5]. **Mr. P.Periasamy, Dr.R. Satish (2014)**, had conducted a study on, “ A Study on Commodity Derivative Market of Selected Non-Agricultural Products (Gold, Crude Oil, Copper) in the Chennai Market- An Analysis. Management Studies -Research Guide, Sathyabama University, Chennai.
- [6]. **Mr. Rohit Bansal, Varsha Dadhich,(2014)**, had conducted a study on, “Indian Commodity Market- A Performance Review. Department of Management Studies, Vaish College of Engineering, Rohtak.
- [7]. **Ahmed Imran Hunjra,(2011)**, had conducted a study on “Risk and Return Relationship in Stock Market and Commodity Prices. International Journal of Research in Finance and Marketing
- [8]. **Bhaskar Goswami, Isita Mukherjee (2015)**, had conducted a study on, “Risk-Return Analysis of Different Commodity Futures in Indian Derivative Market
- [9]. **R. Chakrapani (2012)**, had conducted a study on, “A Study on Forecasting Predicting Commodity Prices Of Gold Movements With Use Of Holt-Winter Model Trend Smoothing Method at Hyderabad Stock Exchange. Vani Nikethan Institute of ManagementStudies, Mukarampua, Karimnagar, AP, India.