A STUDY ON THE RISK-RETURN PROFILE OF SELECT COMMODITIES WITH SPECIAL REFERENCE TO THE INDIAN STOCK MARKET

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ABSTRACT

Commodity trading in India has been around for centuries. This market has only been recently brought under the purview of the organised exchanges in recent times. Commodity market has a huge potential and can be an alternative to the stock market for investment purposes. In this paper we try to compare the risk return profile of the Indian commodity markets represented my MCXAGRI, MCXMETAL, MCXENERGY and Indian stock market by BSESENSEX on yearly basis. The data taken for this purpose is daily closing prices of the respective indices from 2007 to 2016.

KEYWORDS: *Risk Return Profile, Coefficient of Variation, ANOVA.*

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Introduction

Commodity refers to any good that possess a physical attribute. The word commodity comes from the French word **"commodite"** which is used to refer to an object that offers some convenience or useful service. It is a thing of value, with uniform quality, produced in large quantities by many different producers. The commodity can be produced by different producers, but will still be considered equivalent. By this definition, any physical substance like pepper or aluminium, which is interchangeable with another product of the same type , is a commodity.

The Forward Contracts Regulation Act. (An Act passes in India in 1952 to provide for the regulation of certain matters relating to forward contracts, prohibition of options in goods and for matters connected therewith) defines goods as "every kind of movable property other than actionable claims, money and securities". The Indian experience in commodity futures market can be tracked back thousands of years with reference to such markets in India appearing in Kautialya's Arthasastra. However organised trading in commodity derivatives began in India with the setting up of the Bombay Cotton Trade Association Ltd in 1875. Following this he Gujarati Vyapari Mandali was set up in 1900 to carry out futures trading in groundnut, castor seed and cotton. Forward trading in raw jute and jute goods began in Calcutta with the establishment of the Calcutta Hessian Exchange Ltd in 1919. Later, East Indian Jute Association Ltd was set up in 1927 for organising futures trading in raw jute. These two associations amalgamated in 1945 to form the present East India Jute & Hessian Ltd, to conduct organised trading in both raw jute and jute goods.

After independence in 1947, the subject of futures trading was placed in the Union list, and the Forwards Contracts (Regulation) Act,1952 was enacted. Later on the Essential Commodities Act was passed in 1955 to provide, in the interests of general public, for the control of the production, supply and distribution of, and trade and commerce in certain commodities. It gave the Central Government for securing equitable distribution of essential commodities and their availability at fair price.

Currently there are five national level and 16 commodity specific regional exchanges as listed below:

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A. National Multi Commodity Exchanges

1. National Multi Commodity Exchange of India Ltd., Ahmedabad (NMCE).
2. Multi Commodity Exchange of India Ltd., Mumbai (MCX).
3. National Commodity & Derivatives Exchange Ltd., Mumbai (NCDEX).
4. Indian Commodity Exchange Ltd., Mumbai (ICEX).
5. ACE Derivatives and Commodity Exchange, Ahmedabad.

B. Commodity Specific Regional Exchanges

1. Bikaner Commodity Exchange Ltd, Bikaner.
2. Bombay Commodity Exchange Ltd, Mumbai.
3. Central India Commercial Exchange Ltd, Gwalior.
4. Cotton Association of India, Mumbai.
5. The Chember of Commerce, Hapur.
6. East India Jute & Hessian Exchange Ltd., Kolkata.
7. First Commodity Exchange of India Ltd, Kochi.
8. Haryana Commodities Ltd., Sirsa.
9. India Pepper & Spice Trade Association, Kochi.
10. The Meerut Agro Commodities Exchange Company Ltd, Meerut.
11. National Board of Trade, Indor.
12. Rajkot Commodity Exchange Ltd., Rajkot.
13. Spices & Oilseeds Exchange Ltd, Sangli.
14. Surendranagar Cotton Oil & Oilseeds Association Ltd, Surendranagar.
15. The Rajdhani Oil & Oilseeds Exchange Ltd, New Delhi.
16. Vijai Beopar Chamber Ltd., Muzaffarnagar.

Literature Review

Black, F. and J. C. Cox, 1976, studied that Portfolio diversification is very important for the investors, especially for financial institutions, such as banks, pension funds.

Ankrim, E. & Hensel, C. (1993), studied that sharp rises in commodity prices and in commodity investing, many commentators have asked whether commodities nowadays move in sync with traditional financial assets.

Erb, C., and Harvey, C. (2006), they studied that the way returns on commodity futures differ over time from those of traditional asset classes (by stock and bond indices around the world). We find that the conditional return correlations between S&P50 index and commodity futures fell over time. This suggests that commodity futures and equity markets have become more segmented and, thus, commodity futures have become over time a better tool for strategic asset allocation.

Hull, J. and White, A., 2004, studied that the impressive rise in commodity prices since 2002 and their subsequent fall since July 2008 have revived the debate on the role of commodities in the strategic and tactical asset allocation process. Commonly accepted benefits include the equity like return of commodity indexes, the role of commodity futures as risk diversifiers, and their high potential for alpha generation through longshort dynamic trading.

Mauro, P. (1995), studied that Commodity markets are markets where raw or primary products are exchanged. These raw commodities are traded on regulated commodities exchanges.

Data & Methodology

The study is based on secondary data. In this time series analysis the data related to agricultural product, metal, energy and stock market is collected from Multi Commodity Exchange of India and Bombay Stock Exchange for the time period in between 2007 and 2016.The data are indices namely MCXAGRI,MCXMETAL,MCXENERGY and BSESENSEX.

In this paper a risk-return profile is created year wise. Risk is measured in terms of Coefficient of Variation. Usually standard deviation is considered to measure risk, but in this paper Coefficient of Variation is taken as there are two different markets, namely commodity and stock markets. Hence Coefficient of Variation will give a more comparable picture of the risk between the two different markets.

The coefficient of variation (CV) is defined as the ratio of the standard deviation   to the mean **μ**

The formula to find the sample mean

$$\mu = \frac{\sum x}{n}$$

Formula to calculate sample standard deviation

$$\sigma = \sqrt{\frac{\sum (x - \mu)^2}{n-1}}$$

Formula to calculate **coefficient of variation**

$$CV = \frac{\sigma}{\mu}$$

Secondly, for return we have considered yearly return. The study relies on daily closing data of MCXAGRI, MCXMETAL, MCXENERGY and BSESENSEX. The daily closing values of all the indices are then converted to daily returns using the logarithmic difference of prices of two successive periods as follows:

$$R_t = \ln (P_t / P_{t-1}) \times 100$$

Where,

$\ln(z)$ is the natural logarithm of **'z'**

P_t be the closing price on date **t** and

P_{t-1} be the closing price on date **t-1**

A comparative analysis of risk and return on yearly basis is done.

The inference is drawn on the premise that any rational investor would want higher return (risk premium) when risk is high and expect lower return when risk is low.

ONE WAY ANOVA was tested on the yearly return data to observe if there is any significant difference between the mean of the returns of the markets. The hypothesis for ANOVA is as follows;

H_O: All population means are equal.

H_A: At least one mean is different.

Findings

A comparison of Return and Coefficient of Variation has been plotted in Table 1 below:

Table 1

Year	MCXAGRI Return	C.V.	MCXENERGY Return	C.V.	MCXMETAL Return	C.V.	BSESENSEX Return	C.V.
2007	1399.929	0.026	1400.16	0.098	1399.972	0.037	1142.457	0.147
2008	1409.128	0.102	1408.715	0.243	1408.993	0.126	1132.129	0.217
2009	1358.483	0.102	1358.996	0.161	1358.946	0.125	1119.65	0.223
2010	1414.028	0.091	1413.845	0.042	1414.058	0.091	1160.664	0.075
2011	1418.536	0.064	1418.589	0.077	1418.491	0.054	1137.194	0.066
2012	1413.485	0.176	1413.759	0.040	1413.896	0.038	1156.126	0.054
2013	1418.473	0.047	1418.608	0.105	1418.307	0.065	1151.379	0.039
2014	1238.616	0.098	1233.627	0.121	1234.09	0.037	1123.923	0.104
2015	1183.484	0.050	1187.867	0.112	1188.002	0.048	1142.031	0.043
2016	1192.997	0.077	1193.123	0.145	1192.903	0.059	1137.496	0.057

On critically analysing the data set it has been observed that return for the commodity indices i.e., MCXAGRI, MCXENERGY, MCXMETAL has been decreasing from 2007 through 2016 but for BSESENSEX the return is almost similar through the years. C.V in the year 2007 was low for commodity indices when compared with stock market index but then increased from 2008. However, it has been observed that the return for commodity indices is higher than the stock market. This is true for the C.V also. This is in line with the premise that rational investors expect a higher return when risk is high. Test of One Way ANOVA was carried on the return data set and it was found that there is significant difference between the means of the commodity returns and the stock market returns. However, there is no significant

difference between the means of the three commodity market indices (MCXAGRI, MCXENERGY, MCXMETAL). This can be observed in table 3 and also in the mean plot represented in Fig 1.

Conclusion

From the above analysis it can be concluded that Indian commodity markets has a higher return in comparison to Indian stock market. Risk measured in terms of C.V is higher for the commodity market as well. As risk and return is higher, it can be said that Indian commodity markets can be an alternative to the Indian stock market, especially for those investors who are looking for higher gain. Hence, for a higher capital appreciation it is advisable to invest in the Indian commodity market.

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Appendix
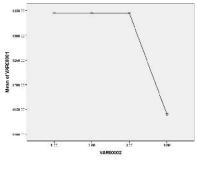
Table 2 : ANOVA of Returns

Multiple Comparisons

Dependent Variable: VAR00001

LSD

(I) VAR00002	(J) VAR00002	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1.00**	2.00	-.01300	38.37677	1.000	-77.8447	77.8187
	3.00	-.04990	38.37677	.999	-77.8816	77.7818
	4.00	204.41100*	38.37677	.000	126.5793	282.2427
2.00**	1.00	.01300	38.37677	1.000	-77.8187	77.8447
	3.00	-.03690	38.37677	.999	-77.8686	77.7948
	4.00	204.42400*	38.37677	.000	126.5923	282.2557
3.00**	1.00	.04990	38.37677	.999	-77.7818	77.8816
	2.00	.03690	38.37677	.999	-77.7948	77.8686
	4.00	204.46090*	38.37677	.000	126.6292	282.2926
4.00**	1.00	-204.41100*	38.37677	.000	-282.2427	-126.5793
	2.00	-204.42400*	38.37677	.000	-282.2557	-126.5923
	3.00	-204.46090*	38.37677	.000	-282.2926	-126.6292

* The mean difference is significant at the 0.05 level.

**1= MCXAGRI, 2=MCXENERGY, 3=MCXMETAL,4=BSESENSEX

Fig 1: Mean Plot of Returns

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