How attractive is the Commodity Futures in India?

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Abstract

The purpose of this paper is to evaluate return and its associated risk of commodity futures vis-à-vis other financial assets in India. The paper is based on the review of empirical study on risk-return of twenty three (23) actively traded commodity futures from different sectors and comparing them with other financial assets like common stocks, long-term government bonds and treasury bills. The span of study period is 2004 to 2012. The results obtained from this study can throw important insights regarding the investors' preference of financial assets in India.

Keywords: Bonds, Commodity futures, Common stocks, Return, Risk,T-bills.

JEL Classification: G10, G11, G12, G13.

Introduction

Commodity futures markets have traditionally been a contentious issue across the world. Futures markets are considered to be highly beneficial (at least, theoretically) because of their price discovery and risk minimization functions. Recently commodity futures market has achieved a phenomenal growth everywhere in terms of volume of trade, number of product on offer and transparency. However, it is observable that till late-1980s, its use was limited to a few developed countries where futures market has emerged as a highly developed and organized market.

Indian commodity future market was relatively popular till early 70s. But, historically governments in many of the developing countries have discouraged futures markets and its growth was fraught due to diverse restrictions and regulations. The spontaneous growth of commodity futures market in India was witnessed in the post 2003 when these restrictions was relaxed with the initiation of liberalization in forward trading markets. The following data bears testimony to the ever increasing market of commodity futures. The volume of commodity futures has increased from about Rs 1.29 lakh crore in 2003–04 to a peak of Rs 181 lakh crore in 2011–12, and settled at Rs 170.5 lakh crore in 2012–13. [1]

[1] Data source: www.fmc.gov.in

However there are several arguments against futures markets which points to the various flaws- inflation or rising price volatility is one of such major flaws. Such opinion is to be empirically tested and validated which is not the scope of the current research. On the contrary, this paper explores the attractiveness of commodity futures as an asset vis-à-vis other financial assets in India. Our paper provides a comparison of commodity futures contracts traded in India with common stocks, long term government bonds and also t-bills from the view point of the rates of return. The various forms of returns considered are nominal return, real (inflation adjusted) return and risk premium form. Such a comparative exercise would shed some light on the performance of these assets in presence of inflationary pressure and risk- free assets. The study period is 2004-2012. We choose this study period as the futures trading in post reform India started in full swing from 2004 onwards.

The rest of the paper is organized as follows. Section 2 presents a brief review of the existing literature and points out the value addition of the present study. The methodology and the source of data are set out in section 3. Finally section 4 contains the result and observations of this study.

Section 2: A brief review of literature

In India, very few works on commodity futures are notable till now and most of the published research is centralized on the issue of price discovery and the value and volume of trading on commodity futures. Generally, the literature on futures trading is dominated by empirical works. K.G. Sahadevan (2002) explained about the efficiency of commodity futures, the constraints and policy options for Indian commodity futures market. The impact of Commodity Transaction Tax (CTT) in the Indian context is discussed by Pravakar Sahoo and Rajiv Kumar (2008). Golaka C. Nath and Tulsi Lingareddy (2008) explained the effects of commodity futures trading on spot prices of pulses. The role of commodity futures and its impact on commodity prices are highlighted by Nilanjan Ghosh (2009). Sunanda Sen and Mahua Paul (2010) explained the futures trading on agricultural commodities in India. The role and growth of commodity futures and highlighted on the relationship between commodity futures and others economic factors are examined by Dharambeer and Barinder Singh (2011). P. Vinod Kumar (2012) selected two crops and explored the impacts of futures trading in India. The relation between commodity derivative market and price inflation are discussed by Nissar A. Barma & Devajit Mahanta (2012). Bhaskar Goswami and Isita Mukherjee (2013) selected ten agricultural commodities from the basket of Indian commodity futures and explained their returns. Brajesh Kumar and Ajay Pandey (2013) examined the short run and long run market efficiency of Indian commodity futures market. They had selected agricultural and even nonagricultural commodities for testing market efficiency. The result concluded that commodity futures prices are more efficient in long run than the short run. Bhaskar Goswami and Isita Mukherjee (2013) provided a comparative analysis of risk and return between agricultural commodity futures with others financial assets in Indian commodity futures market. Bhaskar Goswami and Isita Mukherjee (2015) explained about the performance of different groups of commodity futures as agricultural, metals, energy, oil and oil related products in the presence of risk-free assets and inflation.

A comparative study between the rate of return of commodity futures and the rate of return on stock and bond in the context of the Indian economy is the research gap that the present study would like to address. In terms of different categorization of returns as nominal, real and excess returns, this paper provides the relationship between commodity futures with inflation. Furthermore, the volatility aspects of commodity futures vis-à-vis other financial assets like stocks and bonds are also the issues this study paper would like to focus on.

Section 3: Source of data and methodology

For this study, we have selected 23 (Twenty Three) Commodity Futures consisting of 10(ten) most actively traded agricultural commodities (Chana, Jute, Kapas, Pepper, Wheat, Rice, Potato, Yellow peas, Sugar and Urad), 5(five) metals (Aluminum, Copper, Gold, Lead and Silver), 2 (two) energy futures (Crude Oil and Natural Gas), 6 (Six) Oil & Oil Related Products (Castor Oil, Mentha Oil, RBD Palmolein, Soy seed, Mustard seed and Coconut cake). This choice of the commodities futures is based on two criterions as- (i) frequency of future contracts within the study period and (ii) volume/value of such futures are considered to capture the relative importance of these selected commodities. In this case, the contracts for the different commodities were held for three months and then liquidated. The required data related to commodity futures have been taken from the official website of Multi Commodity Exchange (MCX), Mumbai, from 2004 to 2012.

For calculating the nominal returns of the commodities, the following steps are used:

- Nominal return for every individual contract for three months holding period = [((closing price of the last date of individual contract/expiry date) - (opening price of the first date of individual contract/expiry date)) / (opening price of the first date of individual contract/expiry date)] x 100
- Then the Annual Nominal return is calculated and the average is taken for each individual year.

The real returns of these commodity futures are calculated as:

[(nominal return of individual commodity for that year) - (rate of inflation as measured by proportional change in average weighted wholesale price index (wpi)] / [1 + (rate of inflation as measured by proportional change in average weighted wpi for that commodity on that year)] and then the Real return per year is the average of real return of selected commodities for individual year.

In terms of excess returns (that is, the risk premium) of these commodity futures, simply the difference between the nominal return of individual commodity for that year and the average T-bill return on that year is taken and the average of it taken into consideration.

Data related to other assets like long term government bonds, T-bill and the Price Index (PI) are collected from the RBI site. The nominal returns of government bonds are calculated as the average of maximum and minimum yield to maturity.

The data on common stocks of BSE and NSE are compiled from the Capital Line Database 2000. We have selected 120 companies from BSE and 60 companies from NSE and these stocks are selected on the basis of the top ranking companies enlisted in BSE and NSE.

For calculating the nominal returns of the common stocks the conventional practice is followed where Nominal Return for individual year of individual stocks is equal to the difference between the closing price of stock at period t+1 and the closing price of stock at period t. Then the average of the annual nominal returns is considered. Now in the case of real return, the nominal returns are deflated by the rate of inflation (as measured by proportional change in average weighted wholesale price index).

The result of the study is set out in the following section in terms of comparison between the different forms of returns from the alternative assets.

Section 4: Observation

Table no.1: Annual rates of return from the alternative assets and rate of inflation

	Commodity Futures	***Common Stocks***	***Long-Term Government Bonds***	***Treasury Bills***	***Rate of Inflation***
2004	4.04	46.47	11.54	5.99	0.02
2005	5.47	168.48	11.82	6.77	0.05
2006	35.49	17.25	12.02	6.37	0.05
2007	-3.59	47.85	12.13	7.18	0.09
2008	16.57	-153.08	12.15	7.61	0.02
2009	22.06	279.03	12.14	3.72	0.10
2010	16.44	75.24	12.13	5.38	0.10
2011	54.25	14.99	12.12	8.00	0.06
2012	0.27	62.03	12.14	8.53	0.05

Table no.1 illustrates the information about the annual rates of return for each type of investment instruments, that is, commodity futures, common stocks, long-term government bonds, treasury bills and rate of inflation (that is, the proportional change in Wholesale Price Index). Here we see that, 2011 marks the highest annual return from commodity futures. Interestingly, common stocks have negative return in the year 2008 only and the next year 2009 give the highest return for common stocks. A plausible explanation may be the confidence factor of the FIIs in the Indian stock market just after the subprime crisis.

Table No.2: Comparison of Nominal Returns (per cent per year)

	Mean	***Standard Deviation***	***Standard Error***	***No. of Years Returns Are Negative***	***Mean Annual Loss***[2]	***Highest Annual Returns(Year)***	***Lowest Annual Returns(Year)***
Commodity Futures	16.78	18.57	6.19	1	-3.59	54.25	-3.59
						2011	2007
Common Stocks	62.03	117.01	39.00	1	-153.08	279.03	-153.08
						2009	2008
Long-Term Government Bonds	12.03	0.21	0.07	0	0.00	12.15	11.54
						2008-2012	2004
Treasury Bills	6.62	1.47	0.49	0	0.00	8.53	3.72
						2012	2009

Table no. 2 provides the comparison between nominal returns of selected commodity futures, common stocks, long-term government bonds, and treasury bills. The mean and standard deviation (s.d) of total nominal returns for all these commodity futures over the study period are 16.78 and 18.57 respectively. In the case of common stocks, the average return is 62.03 with very high standard deviation 117 and thereby signifying high volatility in stock market. In the case of long-term government bonds, the mean return is 12.03 and standard deviation is 0.21. Quite naturally, long-term government bonds and treasury bills offers positive returns for all the years in the said study period. For this reason these two financial assets have no mean annual loss. Mean annual loss on common stocks is -153.08 as opposed to -3.59 for the commodity futures. Moreover, the figures of standard error (s.e) imply that commodity futures market (6.19) is more stable compared to stock market (39.0).[3]

[2] Mean annual loss is defined as the sum of the annual losses (negative rates return) divided by the number of years consisting negative returns.

[3] According to Boyce's theory, higher is the value of s.e. of a market, greater is the instability of that market. However, this is not a strict version of defining s.e.

Table No.3: Comparison of Real Returns(per cent per year)

	Mean	***Standard Deviation***	***Standard Error***	***No. of Years Returns Are Negative***	***Mean Annual Loss***	***Highest Annual Returns(Year)***	***Lowest Annual Returns(Year)***
Commodity Futures	16.49	19.24	6.41	1	-3.39	56.59	-3.39
						2011	2007
Common Stocks	56.88	109.65	36.55	1	-149.92	253.93	-149.92
						2009	2008
Long-Term Government Bonds	11.31	0.29	0.10	0	0	11.88	10.97
						2008	2009
Treasury Bills	6.22	1.48	0.49	0	0	8.11	3.30
						2012	2009

Table no.3 offers the summary of the real returns (or said in other words, the wpi adjusted returns) of the four alternative assets. The common stocks consist of the highest mean real return and also the highest standard deviation, similar as in the case of nominal returns. Treasury bills and long term govt. bonds mark positive returns for the study period. The average real return of commodity futures are 16.49 and standard deviation is 19.24 as same as in the case of nominal return. Moreover, the mean nominal return is higher than the mean real return in the case of others financial assets. An economic explanation behind these observations can be posited as follows- as rate of inflation is necessary in the computing the real returns, then the case is that the prices of commodities is one of the major source of the inflation within this said study period

Table No.4: Comparison of Excess Returns (per cent per year)

	Mean	***Standard Deviation***	***Standard Error***	***No. of Years Returns Are Negative***	***Mean Annual Loss***	***Highest Annual Returns(Year)***	***Lowest Annual Returns(Year)***
Commodity Futures	9.72	17.90	71.17	4	-8.11	37.40	-15.42
						2010	2012
Common Stocks	55.41	117.97	39.32	1	-160.69	275.31	-160.69
						2009	2008
Long-Term Government Bonds	5.41	1.60	0.53	0	0	8.41	3.01
						2007	2004

Table no. 4 presents the measures of excess returns, that is, the risk premium. The average risk premium associated with common stocks (55.41) is definitely higher than the futures (9.72) and government bonds (5.41). Surprisingly, the risk premium of common stocks is six times higher than the risk premium of commodity futures.

To sum up, this paper reveals the risk-return performance of some financial assets in India over the study period 2004-2012[4]. We see here that, all the forms of returns (nominal, real and excess) are greater for the common stocks. At the same time, volatility is also higher for common stocks compared to other assets under consideration. For commodity futures, the best (worst) performance is in the year 2011 (2007). The best (worst) performance of common stocks comes in the year 2009 (2008), mostly due to the aftermath of the sub-prime crisis as Indian stock market was a favored destination for FIIs.

[4] The study covers 9 years of observation which by any standard might appear to be a small sample period. But then, for any meaningful comparison between the alternative assets, it is necessary that all the types of assets (intended for the comparative study) must be operational simultaneously. In the Indian context, data reveals that agricultural commodity futures market were active post 2004 onwards without any break or disruptions in trading of the selected commodities.

Furthermore, the standard deviation of the real rates of return on commodity futures is as same as the standard deviation of their nominal rates of return. This same result is also shown in the case of long term government bonds and also t-bills. In the case of common stocks, the opposite result holds, that is, the standard deviation of real return is lower than the standard deviation of nominal returns. Common stocks earned the highest return as well as the most risky asset among the alternative financial assets in respect of all forms of returns. Long term government bonds & treasury bills are the least risky assets out of financial assets and earned a lower mean return than commodity futures and stocks. Whereas commodity futures hold a tolerable position with respect to both risk and return. This study reveals that during the study period 2004-2012 high returns are generally associated with high risk, as per the suggestion of general theory of risk-return. From this analysis the result we get that although common stocks gave the highest return among the all financial assets but it proved to be a poor inflationary hedger while commodity futures provided an effective hedge against the inflationary pressure. Lastly, the paper throws some light on the issue whether the results follow the Normal Backwardation Hypothesis. Risk premium is that amount of return which is the difference of expected nominal return and the risk-free return and the positive average excess return of commodity futures obtained from this analysis support the Normal Backwardation Theory.

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