

VOLATILITY IN INDIAN COMMODITY MARKETS: 2013-2015

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Abstract

Assets prices are a function of factors and developments in global markets. Commodities are raw materials used in the specific production process. Commodity prices are influenced by a multitude of demand and supply-side factors. Domestic as well as global developments play a key role in prices of agricultural commodities. Volatility in prices, i.e. sharp upward or downward movement in prices is a key issue associated with prices of commodities. Volatility in prices of crude can have a debilitating impact on currency, production and also can create serious payments problems for the country as in the case of India in the early 1990s. The aim of the paper is to examine the volatility in the commodity markets in the last two years in terms of returns on index and understand the reasons for the recent trends of trade and returns on the commodity bourses. Descriptive statistics are used on data from MCXCOMDEX in two time periods 2013-14 and 2014-15 to examine the volatility in the returns. It is found that not only have returns reduced but volatility has increased in 2014-15 however the decline value traded has reduced. Given the importance of commodity markets and efficient price discovery, this may be the time for the regulators to strengthen the commodity markets.

Key Words: Commodity Markets, MCX, mean return, standard deviation, volatility.

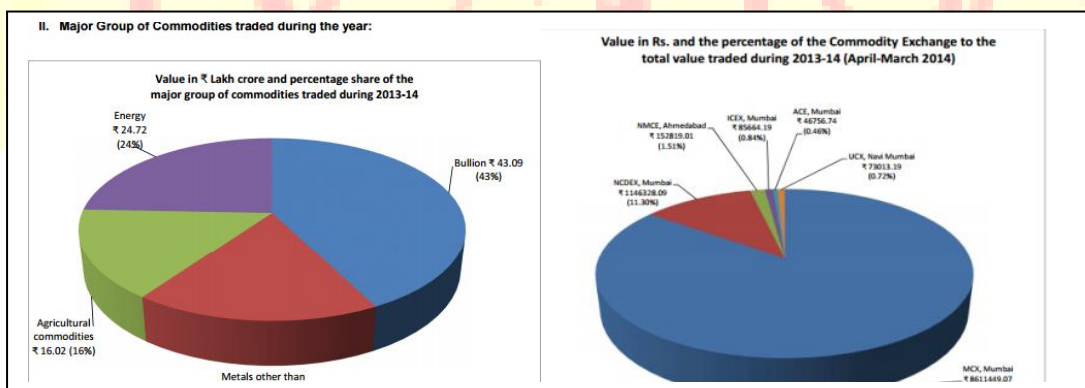
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1. Introduction

The commodity market facilitates purchase and sale of various commodities. These transactions can be in the spot market where the trade is for immediate delivery or in the derivatives market where transactions are based on the future value of the commodities traded including futures. Futures are standardized, exchange traded contracts to buy or sell the commodity at a future date at today's future price.

The commodity trade in India began as early as late 1800s with the Bombay Cotton Trade Association introducing cotton contracts. Organized commodity derivatives in India started in 1875. The futures market was banned during the Second World War and then after 1966, futures trade was disallowed. It is only post and financial sector deregulation and real reforms after 1991, that commodities market and futures trading was re-examined by the regulators and only after 2003, futures trading on all commodities was permitted. However, the introduction of futures resulted in speculation and more cash price volatility in the price levels. The speculative activity had adverse impact on spot prices of the underlying commodities hence a ban was imposed on the commodity futures in 1952.

India Commodities futures contracts and the commodity exchanges are regulated by the Forward Contracts (Regulation) Act, 1952. The regulator is the Forward Markets Commission (FMC), a division of the Ministry of Consumer Affairs, Food and Public Distribution. The FMC regulates forward trading in 113 commodities at the 12 Recognized Commodity Exchanges, of which 6 are National Commodity Exchanges and 11 are Commodity Specific Regional Exchanges.



Source: FMC, Annual Report, 2013-14

According to annual reports of FMC, six commodities exchanges contribute close to 99.72% of the total value of the commodities traded during the year 2013-14. With commodities futures trade booming since 2004, there has been a sharp increase in trading volumes, market participation and the number of commodities traded including agricultural products, bullion, metals and energy products. A robust commodities market leads to better price discovery mechanism, risk mitigation, transparency in trades and more participation. The market includes participants encompassing the producers to traders, financiers, speculators and corporates.

2. Factors affecting Commodity Market

Assets prices are a function of factors and developments in global markets. Commodities are raw materials used in the specific production process. However since they are traded on the exchange, they take the become assets for the means of investment. Commodity prices are influenced by a multitude of demand and supply-side factors. The price of agricultural commodities traded on the commodities exchange is on their production which, in turn, depends largely on weather conditions. The non-agricultural commodities are closely impacted by global market developments, in terms of monetary policy changes, macro-economic data of major economies, and fluctuations in currency markets.

Economic and political conditions in the commodities' producing countries also cause volatility in commodity prices. Reduced demand for goods leads to slower production which consequently leads to changes in demand and therefore prices of commodities. Change in tariffs and taxes also cause a change in trade and prices of commodities. On the supply side, innovations in production process or even extraction of commodities also impact the traded price of these commodities.

Commodities prices generally are positively related to inflation and hence can be used to mitigate inflation risk. This, in turn, makes commodity prices sensitive to inflationary expectations. Speculation in commodity trade also plays an important role in the price discovery mechanism in commodities.

The prices of precious metals are driven by households' demand in major consumer countries like India and China, festive season demand in India, as means of investment and also demand by central banks world over. The base metals prices are more dependent on world industrial and

manufacturing-related developments, on the world economic growth and country wise growth. Oil prices are not only related to demand-supply fundamentals but also geopolitical developments.

Prices of agricultural commodities are predominantly driven by demand-supply factors. Domestic as well as global developments play a key role in prices of agricultural commodities. Investment in agricultural commodities, presupposes the knowledge of sowing and harvesting period, weather and soil conditions, consuming and supplying economies, costs of production and changes in government policies.

More important than domestic factors are international news related to economic growth of developed economies such as Jobless Data release from US, US Federal Reserve meetings' releases, retail sales and new homes data including crude oil inventories and natural gas inventories. Strong metal consumer and supplier nations like China play a significant role in the commodity market. Hence the domestic commodity markets take cue from International market like the NYMEX (New York Mercantile Exchange) or the LME (London Metal Exchange).

3. Price Volatility

Hedging of risk and price discovery are the major two of the most important purposes of futures market. Futures markets carry out risk allocation through the futures contracts. These futures contracts are used to lock-in future prices rather than depending on tentative spot price movements. The process whereby market information is gathered to make price converge at the efficient price of the underlying asset is known as 'Price Discovery'.

Volatility in prices, i.e. sharp upward or downward movement in prices is a key issue associated with prices of commodities. Price in any market is decided by the forces of demand and supply. Hence volatility in commodity prices can be attributed to issues related to production and harvests and also due to changes in demand. This price volatility creates *risk* for both producers and consumers. Volatility in commodity prices, being directly linked to income of producers and profitability of consumer has a major impact on economic output in economies. Volatility in prices of crude can have a debilitating impact on currency, production and also can create serious

payments problems for the country as in the case of India in the early 1990s. Lower prices mean lower revenue for commodity producing countries and hence lower economic output.

Besides producers and consumers of commodities, volatility on food prices can have devastating impact on the entire population. This was seen during 2007-08, where rise in food prices led to food riots in many developing countries, led to huge deficits in trade balances of economies having inelastic demand for oil and food products. Spikes in commodity prices can also pose challenging problems in poverty alleviation, food security, inflation control and macroeconomic stability. These ill-effects of volatility in commodities price, led to the strengthening of the price formation on commodity derivatives by introducing commodity trade reforms. The deregulation of the commodity futures market in India was step in the direction to hedge against volatility in commodity prices and to protect the economy from the ill-effects of volatility. The commodity futures help in the price discovery process. In futures markets where the market participation is predominantly skewed towards speculators, the future market will not only be ineffective but also pose heightened risk for the producers, traders, processors and other stakeholders. The Forwards Market Commission was instituted in September 2013, under the control of Ministry of Finance, to protect the interest of all stakeholders in commodity trade.

4. Review of Literature

Volatility of prices is one of the most important issue facing producers of primary commodities. Volatility in prices of basic commodities, make it difficult for farmers to optimize their earnings, with the prices of basic commodities being low (Morgan, 2000). Although there is long-run equilibrium in prices of many commodities traded on many exchanges, there is evidence of short-run inefficiency in most of the markets (Kellard, et al, 1999). Gallant et al. (1992) found a strong relation between commodity price and trading volume wherein the trading volume reflects information about changes in investor's expectation. Gervais et al. (2010), using co-integration, found that a 1 per cent rise in global gross domestic product generates a peak response of 15 per cent in the price of oil and 4 per cent increase in non-energy commodity prices.

Torero (2008) stated that the international food price crisis of 2007-08 created many problems. It led to economic difficulties for the poor, created political issues in many economies and hampered the functioning of market's performance in responding to fundamental changes in

supply, demand, and costs of production. All this can have an adverse impact on the poor and result in irreversible nutritional damage to the population especially among children. According to Ken (2008) monetary shock drives commodity prices wherein tightened monetary policy could cause world recession followed by recovery and financial and price stability. Daniel and Michael (2001) stated that returns in commodity markets are sensitive to volatility in commodity prices. Price discovery across markets is measured by which price moves first in response to new information and which follows (Hasbrouck, 1995). A well-functioning derivatives market is that the derivatives are useful as hedges, financial contracts that provide protection against price volatility (Sahadevan, 2012).

Naik et al. (2001) stated that a major reason for the poor performance of Indian market could be the lack participation of hedgers in commodity trading activities using co-integration. They suggested that commodity exchanges and regulator, the forward markets commission, should try to encourage hedging to improve the performance of these markets. Kakkar et al (2012), studying the price volatility in commodity markets in India, found that rapid, unexpected and often large movements in commodity prices are peculiar in the behaviour of commodity prices. This volatility can have serious consequences for the terms of trade, real incomes and fiscal position of commodity dependent countries, and thus on macroeconomic stabilization.

Examining the issues and concerns of commodity derivative markets in India, Ghosh (2009) concluded that being 'multidimensional' requires more than the reductionist framework of financial economics which is a trans-disciplinary research framework. Bhagwat et al (2015) have explained the importance of commodity futures in India given that India is likely to emerge as a major player in the international market in terms of commodity consumption, production and trade and discussed the mechanism of trading, segments and regulatory framework of commodity market in India.

The level of integration between the spot and futures markets determines the level of influence they have on each other (Sandhya, 2008). Anderson (), found that futures prices are not constant and that it changes over time in a systematic manner and that this is particularly true for annually harvested, storable goods. According to Aggarwal and Thomas (2014), the futures market stores information on the market process and price discovery of commodities. The study also found that

futures help in hedging risk but that the amount of risk reduction varies widely the different commodities.

To study volatility, Blandford (1983) used price data for wheat and coarse grains and used the unconditional standard deviation to examine price volatility. The study used standard deviation of changes in price (from the trend) for two ten-year intervals and found volatility was high. The standard deviation of the rates of change in real prices were used by Heifner and Kinoshita (1994) for a longer time period from 1950 to the 1990s and found that variability increased over the period. The study found that most grains and soybeans exhibited price variabilities below 10 per cent between the 1950's and sixties, but rose to the 20 per cent range during the eighties and nineties.

5. Objective of Paper

The aim of the paper is to examine the volatility in the commodity markets in the last two years in terms of returns on index and understand the reasons for the recent trends of trade and returns on the commodity bourses.

6. Data, Methodology and Results

6.1: Table 1: Percentage change in Value of trade in the commodity markets.

Period	Total Value of trade previous quarter	Total Value of trade this quarter	Total Value of trade this quarter previous	Percentage change over previous quarter	Percentage change over this quarter previous year
July 2013 – September 2013	24.13	41.45	45.91	-41.79	-47.44
October 2013 – December 2013	16.88	24.13	41.99	-30.05	-59.80
January 2014 – March 2014	18.98	16.88	40.84	12.44	-53.53
April 2014 – June 2014	14.55	18.98	41.45	-23.34	-64.90
July 2014 – September 2014	15.27	14.55	24.13	4.95	-36.72
October 2014 – December 2014	15.17	15.27	16.88	-0.65	-10.13
January 2015 – March 2015	16.09	15.17	18.98	6.06	-15.23

Source: FMC Quarterly Reports

According to Table 1, the year 2013-14 witnessed a very sharp decline in value of commodities traded. April to June 2014 witnessed the most fall in comparison to same quarter previous year. From July 2014 onwards, not only has the percentage change in value of trades over previous quarter become positive but also the percentage change with respect to same quarter previous

year although still negative but the percentage value has shown a decline. Hence the decline is reducing.

The MCX transactions account for close to 85 per cent of trade on the commodity markets. For the purpose of analysis in this paper, the MCX indices have been used for study and analysis. The MCX COMDEX comprises of the three sub indices in the following composition:

MCX METAL INDEX	40%
MCX ENERGY INDEX	40%
MCX AGRI INDEX	20%

Daily data on the MCX futures index (MCXCOMDEX) has been examined along with MCXMETAL, MCXENERGY and MCXAGRI for the period August 11, 2013 to August 10, 2014 and compared to August 11, 2014 to August 10, 2015.

Each period has four indices, the COMDEX and its three sub indices. Firstly the four indices in the two time periods: 2013-14 and 2014-15 have been converted to returns data series. Secondly, descriptive statistics of these series have been examined to analyse volatility.

The concept of volatility measures how much a price changes either about its constant long-term level, or about a long-term trend. It measures variability, or dispersion about a central tendency. It does not measure the direction of price changes; it measures dispersion of prices about the mean.

Standard deviation is a measure of examining past behaviour of price movement and measures the variation in the price. To analyse the returns from the indices on daily basis the following series is computed based on the daily closing values for each index:

$$R_t = (\log \text{NSE } t - \log \text{NSE } t-1) * 100$$

Where R_t is the return in period t , $\log \text{NSE } t$ and $\log \text{NSE } t-1$ are the log values of daily closing prices of the each index at time t and $t-1$ respectively.

6.2. Descriptive Statistics of Daily Returns (Table 2):

6.2.1 Volatility in the MCX COMDEX has been higher in 2014-15 as compared to 2013-14. Not only is the standard deviation higher but the mean return in the year 2014-15 has declined further in a larger negative. However both the periods have given negative returns.

Table 3: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
MCX1314	288	-4.86	5.59	-0.0046	0.83901
MCX1415	254	-2.92	2.98	-0.142	0.92548

6.2.2 In the year 2013-14, MCXMETAL and attributed to the volatility in the index, i.e. these two sub-indices show a higher standard deviation. The least return, i.e. the mean is associated with MCXENERGY. MCXMETAL was the only sub-index to give a positive return.

Table 4: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
MCX1314	288	-4.86	5.59	-0.0046	0.83901
METAL1314	288	-5.63	5.71	0.0059	1.02128
ENERGY1314	288	-4.9	6.9	-0.0121	1.1298
AGRI1314	288	-2.38	3.1	-0.0039	0.76074

6.2.3 In the year 2014-15, all the three sub-indices of the MCXCOMDEX have given negative returns. However, volatility in MCXMETAL has reduced and on the other hand volatility in MCXENERGY has increased.

Table 5: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
MCX1415	254	-2.92	2.98	-0.142	0.92548
METAL1415	254	-2.52	3.02	-0.0823	0.81663
ENERGY1415	254	-6.03	7.49	-0.2518	1.88858
AGRI1415	254	-3.1	3.7	-0.0467	0.95272

The table above also shows that there is increased volatility in the MCXAGRI in 2014-15 as compared to 2013-14. According to the World Bank, agricultural prices, which fell 3.4 per cent in 2014, will decline almost 5 per cent in 2015. The volatility in the agri-products can be attributed to the surplus in the market either due to higher production or lower demand which has led to decline in agri-products across the globe and in India.

Reports of the World Bank expect the weakness in commodity prices to continue across 2015 and also state that '*2015 is a rare case*' where all key commodity price indices are expected to decline for the year.

In the current year, the prices of iron ore, crude oil, precious metals, wheat, sugar, cotton, edible oils, among others have fallen from 10 and 50 per cent in Indian and in global markets. With quantitative easing tapering soon and growth yet to pick up in Europe, China, Japan, there is a lack of demand for commodities. With the imminent rise in interest rates in the U.S., the dollar rather than commodities has become safe haven as investment. Even gold has lost its shine to the U.S.dollar.

Certain domestic factors also that have contributed to the decline in the commodity markets:

All-sectors slowdown in economic output in 2013-14 amid inflationary expectations, compounded by global weakness led to decline in trade in commodity markets.

The introduction of the commodities transaction tax (CTT), at the rate of 0.01% to be paid by the sellers on futures trading of non-agricultural commodities, including gold, sugar and edible oils, has led to rise in cost of trading leading to the sharp decline in turnover on commodities markets.

In the fiscal budget of 2013-14, besides introducing the CTT, the rate of tax for equity futures transactions was reduced. Another very significant factor contributing to decline in trade on the commodity exchange could be the alternative available to investors, viz. the futures and options (F&O) segment of equities.

The payments crisis at the National Spot Exchange Ltd (NSE) shook the faith of investors. Additionally, the Forward Markets Commission also hiked the margin requirements for key commodity futures contracts. This had a toll on the monthly average volumes of Multi Commodity Exchange of India Ltd from Rs.12.2 trillion in the first six months of 2013 to around Rs.4.3 trillion in December.

7. Conclusion

Efficient commodity markets are essential to a productive manufacturing sector. The derivative products in the commodity exchanges help to fill in the gaps of asymmetric information,

inefficient pricing and feeble competitiveness. Hence, strengthening of market infrastructure through development of commodity derivatives markets is essential to enhance India's competitiveness at its core.

According to the Global Capital Confidence Barometer, EY's April 2015, a global survey of over 1,600 executives across 18 sectors, 35 per cent of the respondents said their businesses faced greater risk and uncertainty due to the increased volatility in commodities and currencies market in the year ahead. Owing to the markets' uncertainty which hinders the competitiveness of businesses causing losses in times of uncertainty, India's ranking in the World Economic Forum's (WEF) Global Competitiveness Index (GCI) has fallen 71 in the 144 countries covered by the Report in 2014-15, from 60 out of 148 countries covered last year.

Hence this downturn in the commodity markets is the time to consolidate, strengthen and renew. According to Mr. Ramesh Abhishek, chairman, Forward Markets Commission, the current level of trade may be 'without froth', i.e. with speculative trade. The volume that we see now is also a good number because it is a genuine volume'.

The report of the Sub-Committee of the Financial Stability and Development Council (August 2014), reflected on the importance of participation of domestic financial institutions and foreign non-financial entities in commodity derivatives market. Even in the Abhijeet Sen Committee (2008) termed banks' participation in the commodity markets as 'critical'. Even the RBI has advised all scheduled commercial banks to coax the 'agri-borrowers' to hedge their commodity price risks by using exchange-traded derivatives.

In the budget 2015-16, the government has recommended the merger of commodity futures market regulator, the Forward Markets Commission (FMC) with the stock market regulator, the Securities and Exchange Board of India (SEBI), to bolster the control over the commodities market.

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