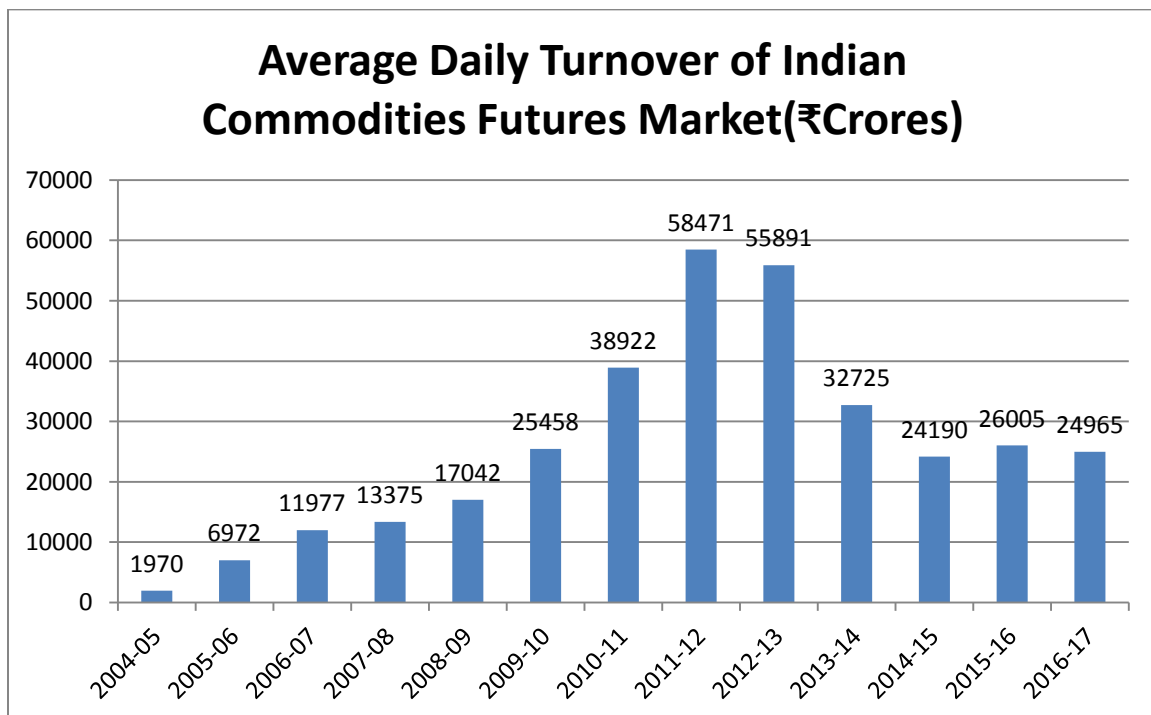# CHAPTER 1

INTRODUCTION TO THE STUDY

The Indian commodity market has been growing in a tremendous pace since the establishment of national commodity exchanges. Notwithstanding the reality that Indian commodity futures are of recent origin, it has developed into one of the emerging commodity futures market in the world over the last decade. "Until 1999, a large amount of the trading in commodity markets took place in US based exchanges. In countries like India, China and Japan, albeit commodity exchanges were launched but the amount of trading in these exchanges was not momentous. As India is one of the leading consumers, producer, importer as well as exporter in a number of commodities there is an boost in economic activity and it have become imperative to scrutinize the commodity trade activities and have a appropriate risk management policy" (Kulkarni,2011). "The risk management of price fluctuations and price discovery are the important functions of commodity market" (Agarwal et.al. 2015).

"Commodity derivatives which were previously developed for risk management intentions, is now gaining attractiveness as an investment instrument" (Hetamsaria & Kaul, 2005). The trading in the commodity market in today's world is made by people who are in no need of the physical delivery of the commodity. As the market emerging, many new investors are involved to the market particularly high net worth investors and retail investors. With the opening of many new products both on and off the exchanges like options contracts, exchange traded funds and future contracts in many new commodities, it convenient for retail investors to have an exposure to the commodity markets.

"Commodity Derivative market in India was resurrected in the year 2003 after a four decade long prohibition" (Sharma, 2015). The three national commodity exchanges viz; Multi Commodity Exchange (MCX), National Commodity Derivative Exchange (NCDEX) and National Multi Commodity Exchange (NMCE) were opened tendering

futures contracts in commodities. "Since the establishment of commodity exchanges, the turnover in Indian Commodity market was increased manifold" (Kevin, 2014). The average daily turnover of Indian Commodities Futures Market from the year 2004-17 is depicted in the chart below.

Chart No: 1.1 Chart Showing Average Daily Turnover Of Indian Commodities Futures Market (₹Crores)

Average Daily Turnover of Indian Commodities Futures Market(₹Crores)

Year	Value
2004-05	1970
2005-06	6972
2006-07	11977
2007-08	13375
2008-09	17042
2009-10	25458
2010-11	38922
2011-12	58471
2012-13	55891
2013-14	32725
2014-15	24190
2015-16	26005
2016-17	24965

Source: MCX Commodity Insights Yearbook 2017.

"The average turnover of commodity markets have increased from ₹1970 crores per day to ₹58471 crores per day in 2011-12. With the introduction of Commodity Transaction Tax (CTT) and the payment crisis happened in the National Spot Exchange Limited (NSEL) in 2013, there was a enormous decrease in volume traded in commodity market from the year 2013-14 and the average turnover per day went down to ₹32725 per day in the year 2013-14. The average daily turnover reached to ₹24965 crores per day in the year 2016-17" (MCX Commodity yearbook 2017). "In 2015-16, Indian Commodity

market observed an important change as SEBI was merged with the previous commodity market regulator Forward Market Commission (FMC) on September 28, 2015."(SEBI Annual report, 2015-16).

"The total turnover of all exchanges have reached to an amount of ₹64,99,637 crores in 2016-17. As on 31st March 2017, about 40 commodities are being traded in various commodity exchanges in India belonging to major segments like bullion, base metals, energy and agricultural commodities. As of March 31, 2017, NCDEX has highest number of commodities (25), followed by MCX (16) and NMCE (13)" (SEBI Annual Report 2016-17). The trading in NCDEX, NMCE and regional exchanges predominantly concentrate on agricultural commodities.

Chart No: 1.2 Chart Showing Number Of Commodities Traded At Commodity Exchanges In India
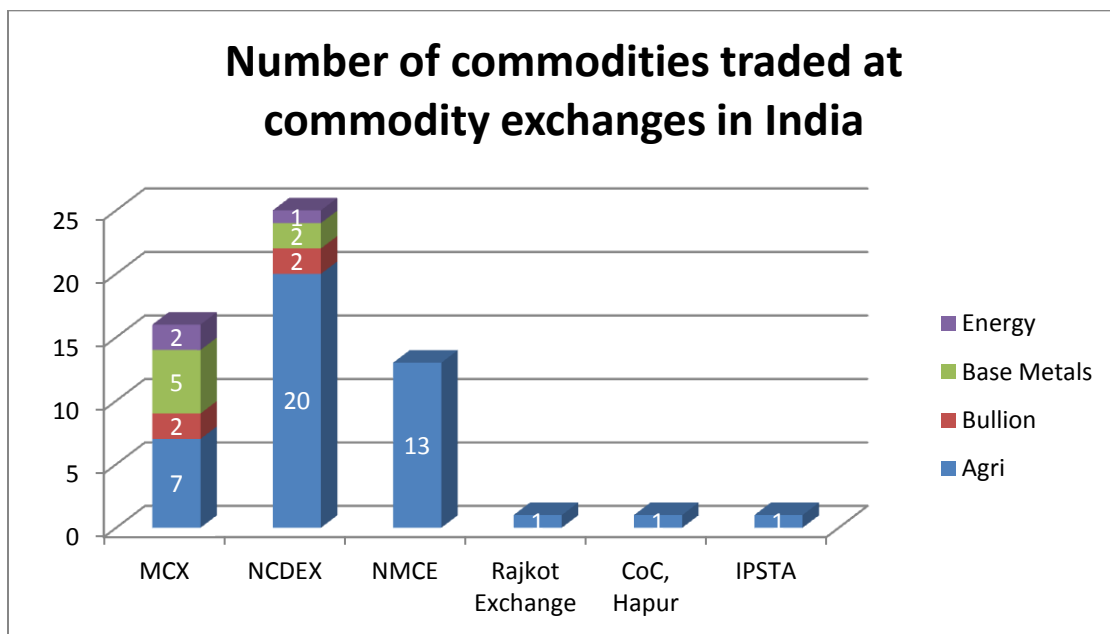
Source: MCX Commodity Insights Yearbook. 2017.

Amongst these commodities, bullion segment is traded the most followed by commodities in base metals and energy. The agricultural commodities are traded the least in spite of of the fact that it has larger number of commodities on offer.

Share of Commodities traded in Commodity Exchanges based on Turnover (%)
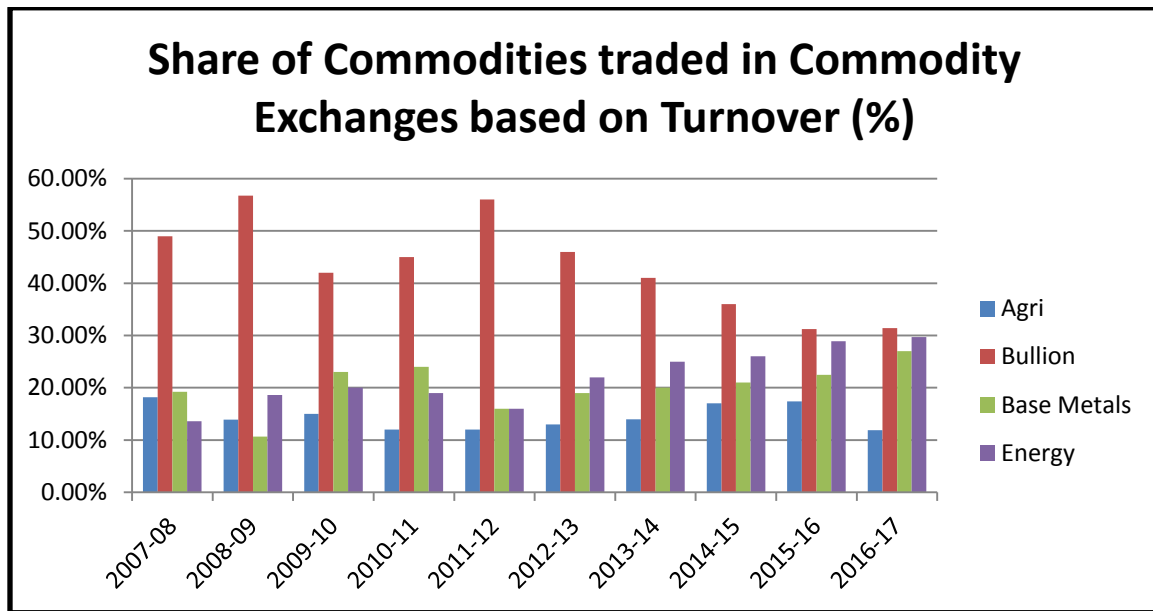
Source: Annual Reports of FMC, SEBI

"In the year 2017, SEBI has proclaimed a much anticipated commodity market transformation of allowing exchanges to launch options contracts. This move has facilitated the Indian commodity market to nurture more and to be an innovative hedging instrument for farmers and other participants". (Choudhary & Modak, 2017). SEBI has permitted option trading in three commodity exchanges viz; MCX, NCDEX and NMCE (Iyengar, 2017). Later MCX have initiated to tender gold options contract from October 2017. "A suggestion of single license for all exchanges is also been made, which will facilitate commodity market exchanges like MCX to begin equity trading and stock exchanges like NSE and BSE trade in commodity derivatives". (Choudhary, 2016), (Shah, 2017).

"Diversification is an imperative facet of Portfolio Management" (Kulkarni, 2011). "It has been recognized that the overall portfolio risk will reduce, if it contains assets whose return move in the opposite directions" (Markowitz, 1952). This indicates

that on a market condition where one asset perform worse, other asset will perform well. In the recent times commodities have come out into a distinct asset class. (Pylypczak, 2015), ("Commodities as an asset class," 2015). "Commodities which have traveled traditionally in opposite direction from equities offer an outstanding alternative for diversification for investors."(Kwek, 2005). With rising incorporation of commodity and equity markets a study need to be made to comprehend the impact of commodity market on equity market. "The commodities are also found to be positively correlated with inflation" (Chatnani, 2017). Alternatively it can be said that commodity prices rise with growing inflation and decline with declining inflation. Thus it can also be said that investment in commodity market offers a hedge against inflation.

"The fundamental intention of commodity market is price discovery which consecutively curtails the risk related with price variations" " (Mahanta, 2011). In these circumstances, futures market should be able to foresee the future spot price thereby enabling in price discovery and curtailing price variations. "The process of price discovery aids in the practice of price stabilization, which preserves the interest of farmers, exporters and other stake holders" (Asthana, 2015). Competitive price discovery is one of the vital functions of commodity market and it is a key benefit of futures trading. Although a number of studies of price discovery and price risk management of commodities markets are done in developed countries, studies are few in India.

"The globalization of economies and advancement of technology have made the domestic and international connections of commodity prices stronger" (Cheng and Xiong, 2014). A developing economy like India, need to efficiently discover the commodities price that are traded globally. As the population being rising steadily, there is an increase in imports to satisfy the increasing demand. This has caused an increased inter linkage between the commodities prices in domestic and global level. "The commodity exchanges play a very important role in achieving the integration between domestic and global markets by assimilating information faster than the spot or physical market" (Berlia, 2013).

Speculative trading of commodities by financial players can have an impact on the volatility of commodity markets. The speculators' motivation is to make profit by

making the prices to shift in his support. This results in the volatility in commodities which can harm the producers, users and exporters of the commodities. There were a few studies in agricultural commodities, which showed that the volatility increased with the introduction of futures (Easwaran & Ramasundaram (2008), Sendhil et.al; (2013) but studies are few in other commodities. This is also an area where studies should be concentrated.

In this regard, present study aims to study the market behavior of commodity futures market in India. The price discovery and volatility Spillover process of Indian commodities future and spot market has been looked into to analyze the efficiency of commodities market

1.1 STATEMENT OF THE PROBLEM

After a long imposed ban, the commodities market in India was re opened in the year 2003. Since then the development of commodities market have been incredible. A large array of research studies are found in international commodities market, which showed the relationship of future and spot prices. According to the principle of Cost of Carry, advocated by Kaldor (1939) and Working (1948, 1949) the commodities future price should be equivalent to spot price plus the carrying cost. Thus commodities futures prices should be high enough to make up for the storage cost whilst arbitrageur anticipates delivery (Chow et.al,2000). In the case of futures market, when buying or selling a futures contract, a trader agrees to receive or deliver a given commodity at a certain time at future at a price decided now. Under such situation, it is likely that there should be a long run relationship between future and spot prices. This is the price discovery role of the futures market. Studies in Price discovery in Indian commodities market have emerged and revealed mixed results. Most of the studies focused on agricultural commodities, or few commodities of same category. However, characteristics of each commodity are different and they react differently. Thus the relationship of futures and spot market on individual commodities which are actively traded in each category have to be analyzed and reported which will give more insights to the commodity market revealing their behavior and inter relationship.

As pointed out by Cheng and Xiong (2014), with the introduction of advanced technology, commodities markets across the globe are interconnected than any time in recent memory. Several agricultural and Industrial commodities have been globalised which resulted in informational abrasions between commodity market participants. The informational frictions faced by the participants of Commodities market are mainly related to relating to supply, demand and inventory of several commodities. The studies in Indian commodities market are limited to regional exchanges with few commodities ranging to a small period of time. Thus the relationship between commodities future and spot markets in an emerging market like India which has been witnessing tremendous growth, needs to be explored and analyzed for a longer period using econometric techniques.

The report of United Nations Conference On Trade And Development (UNCTAD) on Food And Agriculture, 2011 states that the composition of commodities market has been changing radically with the financialisation of commodities market. The presence of financial investors has made commodities as an emerging and useful asset class for portfolio diversification. Diversification can be done by including securities which are not moving parallel to each other. The empirical findings relating to this was found in the studies of (Gorton and Rouwenhorst,2006) were they concluded that commodities are less volatile compared to stock market and the pair wise correlations were also found to be low. With the growth of Commodities market in India, their ability for portfolio diversification with reference to India has to be studied and reported.

1.2 RESEARCH QUESTIONS

Based on the problem statement mentioned above following research questions are raised for further examination:

1. What is the market behavior of futures and spot market of selected commodities in India?
2. How Macro Economic variables like Exchange rate, Inflation, IIP and Stock market impact the commodities market?

3. How does spot market and futures market of a commodity move? Are they co integrated in long run?

4. How is Price Discovery happening in Commodities market? Is Price Discovery happening in futures market or spot market?

5. What is the extent of volatility spillover between future and spot market of selected commodities?

6. How Commodities market can help farmers and other producers to hedge the risk of price fall?

1.3 OBJECTIVES OF THE STUDY

The main objective of the study is to analyze the Price Discovery and Volatility Spillover in Indian Commodities Market with special reference to Multi Commodity Exchange. Based on the research questions mentioned above, following are the objectives framed for the study.

1. To understand the market behavior of commodity futures and spot market.
2. To know the impact of selected macroeconomic variables on commodities market
3. To analyse the Price Discovery process in selected commodities in Indian Commodities Market.
4. To measure the volatility spillover among spot and futures market of selected commodities.
5. To give implications to farmers, investors and policy makers for increasing market participation and further improvement of commodities market.

1.4 METHODOLOGY

The study is based on secondary data relating to actively traded linked commodities from four segments Bullion, Base Metals, Energy and Agricultural Commodities. The period of the study is from 2007-2017; however data period varies across the futures contracts due to late introduction of the commodity futures on the MCX. Daily closing prices of futures and spot prices are taken from the website of Multi Commodity Exchange (MCX).To study the market behavior descriptive statistics; Coefficient of Variation, CAGR and Contango and Backwardation analysis is used. To

study the impact of macroeconomic variables, Mutivariate Step wise regression has been used to avoid spurious regression. The price discovery of the commodity market has been analysed using Johansen and Julises Cointegration test. The co integrated variables are then represented through error correction term using Vector Error correction model to analyse which market incorporates the information first which is reflected in the price. The Wald test has been performed to analyse the short run dynamics of the market. The lead lag relationship among the market have been analysed Granger Causality Test. Bivariate EGARCH model is used to study the volatility Spillover between the markets.

1.5 SIGNIFICANCE OF THE STUDY

The study analyses the Price Discovery and Volatility Spillover of Indian commodity market with special reference to Multi Commodity Exchange. The study will help the investors to understand the price discovery process in Indian commodity spot and futures market there by knowing where the prices are discovered first- in spot market or futures market. Such a study will be helpful for the investors to predict the respective spot or futures prices. The informational efficiency of Indian commodity futures market with respect to their spot counterparts will help the participants in the commodity market to understand the most likely price which will prevail in the market based on the information flow. The present study would greatly help the investors to understand the commodity market better. The study would be beneficial to the commodity producers and processors to make efficient risk hedging strategies. The study would be helpful for the government to undertake measures to further develop the commodity markets.

1.6 LIMITATIONS OF THE STUDY

- The study covers commodities traded in Multi Commodity exchange only. The commodities traded in other commodity exchange have not been taken into account.
- The study analyses the impact of exchange rate, NIFTY, Inflation and IIP with commodity futures market. The impact of other macro economic factors on commodity futures has not been taken into account.

- The study is based on secondary data which has their own limitations which may influence the study.
- The findings and suggestions of the study are based on the selected commodities. So the suggestions of the study may not be applicable to other commodities.

1.7 CHAPTER SCHEME

The research project is organised in following chapters:

i. **Chapter 1**: **Introduction to study:** The first chapter deals with the introduction to the study which provides an overview of the Indian Commodity Market.

ii. **Chapter 2 : Conceptual Framework :** The second chapter deals with concepts and theories relating to commodity market.

iii. **Chapter 3: Review of Litertaure :** The third chapter followed by conceptual framework deals with review of previous research done in commodities market.

iv. **Chapter 4: Research Methodology:** The fourth chapter deals with the tools and methodology used for the study.

v. **Chapter 5: Analysis and Interpretaion :** The fifth chapter deals with Analysis and Interpretation of collected data.

vi. **Chapter 6: Findings and Suggestions**: The sixth chapter deals with findings and suggestions of the study.

vii. **Chapter 7**: **Conclusion:** The conclusion of the study along with implications for future research are presented in this Chapter.