1.1 Introduction

Agricultural commodity prices in India are showing extreme volatility due to many reasons. Demand and supply factors, shift in Government policies, frequent floods and droughts, transport and warehousing problems, lack of finance, strikes, media reports, speculative transactions, hoarding by traders, import and export, global competition, hike in input cost of power, seeds and fertilizer etc are the contributing factors of price volatility. In this context futures market plays an important role in the economy. It has three specific economic functions viz. price discovery, hedging and reduction in volatility.

A commodity futures market is a risk management market. It is not a mechanism for controlling prices. Derivative instruments are used to avoid or
reduce the price risk arising from price variability. It neither raises nor depresses prices. A commodity derivative market cannot find a remedy for prolonged upward or downward movement in the prices, due to inherent demand and supply mismatch. The efficiency of commodity futures contract for effective price risk management depends essentially on the relation between the market price and the futures price discovered earlier. The higher the correlation, the more efficient the futures contract. To ensure such correlation, futures contracts need to be settled on their maturity by either delivery of physical goods or by cash on the due date at prices prevailing in the physical market.

Commodity futures market helps to discover likely or probable prices in future because the players in futures market gather and interpret information regarding demand and supply based on which they formulate the ask price and the bid price. The futures market immediately reflects dynamic adjustments resulting from new information at any time. In addition to price discovery, the economic benefits of commodity futures trading are many. Futures market acts as an information supermarket. It eliminates manipulators in the spot market, integrates geographically separated markets, eliminates intermediaries of the spot market and helps to give better price to farmers for their produce.

Commodity derivative market is a sort of information supermarket which offers price signals to the spot-market. Futures markets are said to emit price signals for the periods ahead which enable growers, producers, processors and manufacturers to plan their activities. In fact, it is generally believed that the futures market assimilates information faster than the underlying product market and efficiently predicts price movements of the product. In an efficient commodity market, the futures price is considered to be an optimal forecast of the spot price at contract termination.
In fact, commodity prices are more susceptible to manipulations and fluctuations in the absence of futures trading. This is because physical markets in most commodities are imperfect than futures market. The facilities for disseminating market information and prices are so built around a futures market that its quotations reach rapidly all parts of the country through quick transmission by modern information technology. As a result, futures prices substantially influence the prices in physical market. Thus futures market acts as a hindrance to market manipulators, exploitations and hoardings.

The physical commodity markets are fragmented in India over regions, mainly because of the varietal differences in agricultural commodities, following the widely varying geo-climatic and soil conditions in different areas and lack of adequate research and agricultural technology. The growth of commodity exchanges has helped to integrate geographically separated markets due to the fact that they are playing the role of reference markets.

The futures market minimizes or eliminates control of a few groups in price determination of commodities. The price transparency of the futures contracts has reduced or eliminated exploitive practices by brokers, middlemen and numerous intermediaries in the commodity supply chains. Futures markets reduce the long chain of intermediaries to reduce the gap between producer’s price and consumer’s price and provide higher share of consumer’s price to the producers.

There are certain cartels in different commodities. Traders in these centres command significant control on price determination of such commodities. This segment thrives on benefit from the fragmentation of the spot market and information asymmetry between producers and well-organized
Chapter 1

traders. The prices discovered on the electronic platform will be determined on the basis of information about demand and supply situations by participants throughout the country. The electronic platform information will lead to a more holistic price discovery and empower producers to maximize their marketing gains and minimize risks. It will eliminate the undue advantage enjoyed by a trading cartel in a fragmented market and make the trading process open.

In the immediate post harvest periods, small farmers with little holding power are compelled to sell produces at depressed un-remunerative prices. Consumers have to pay high prices for food grains in the lean season. Thus both producers and consumers are the losers and the trader is the gainer. Futures market has been envisaged as a solution to the above problem and it enables both the farmers and consumers to adopt suitable strategies based on market trends and futures prices.

All the commodities are not suitable for futures trading. Following are the characteristics of a commodity suitable for futures trading.

1) Volume and marketable surplus of the commodity selected for futures trading should be large.

2) The spot price of the commodity selected for futures trading should be volatile to facilitate hedging through futures trading.

3) The supply, distribution, and price of the commodity selected for futures trading should be free from substantial control from Government regulations and other bodies.

4) The commodity should be homogenous or, alternately it must be possible to specify a standard grade and to measure deviations from
that grade. This condition is necessary for the futures exchange to deal with standardized contracts.

5) The commodity should have sufficient shelf life period. Commodities that are consumed rapidly as they are produced, do not involve much price risks, and hence, do not need futures trading.

Since natural rubber possesses all the specifications required for futures trading, it is one of the most important and favoured commodities in the futures market. India is the fourth largest producer and the second largest consumer of natural rubber in the world. Presently, there are 1250000 (Twelve lakh fifty thousand) small holdings and 538 large rubber estates in India. The number of rubber dealers, rubber manufacturers, Rubber Producers’ Societies (RPS) and Rubber Marketing Co-operative Societies in India are 9533, 4334, 2432 and 35 respectively. During 2012-’13, the production of rubber in India is reported as 913700 tonnes, area of rubber plantation as 75800 hectares, consumption of natural rubber 972705 tonnes, cess collected on natural rubber 128.8 crores, excise duty collected on natural rubber 1282.83 crores and rubber marketed by 266 rubber marketing societies and rubber producers’ societies 57000 tonnes registering a growth of 1.1 per cent, 3.2 per cent, 0.9 per cent, 1.3 per cent, 1.26 per cent and 1.2 per cent respectively compared to the previous year. The average daily employment in rubber plantations in 2012 is 493000 with a growth rate of 1 per cent compared to the previous year.

The price of rubber falls during the months of production and rises during off-season. Generally, a drop in rubber production can be seen during monsoon and summer due to the adverse climatic conditions. Majority of the growers in Kerala are small growers and hence, they cannot hold the commodity for much time. They will be forced to sell the commodity then and there to
meet their needs. It is in this context that the relevance and importance of hedging arises. Future market provides a vehicle by which participants can hedge i.e. protect themselves from adverse price movements in a commodity in which they face a price risk. In general a person wishing to avoid upward price risk would buy futures contracts, thereby hedging himself the price at which he/she eventually purchase. A person wishing to avoid downward price risk would sell futures contract. Similarly manufacturers and dealers can use futures contract to minimize their price risk.

Commodity futures trading in India attained momentum after the starting of national level commodity exchanges in 2003. Futures trading in rubber started on 15th March 2003 on National Multi Commodity Exchange (NMCE). Soon after the starting of the futures trading, trading volume picked up exponentially on NMCE. In May 2008, futures trading in rubber was suspended in an attempt to curb the rise in domestic spot price. But it is paradoxical to state that even after suspension the spot price continued its upward trend. Though the suspension was removed and trading resumed from December 2008, this unexpected ban has created anxiety among market participants and led to a negative impression of the Indian commodity market at the international level.

Review of literature with respect to economic functions of commodity futures trading revealed the following:

- Loss/profit made in the spot market should be compensated by corresponding profit/loss made by futures market.
- Futures trading should reduce the erratic and sporadic spot price variability.
Introduction

- Futures price should act as a reference price for spot market participants.

- Liquidity of the futures market is directly related to trading volume. In order to ensure trading volume there should be large number of buyers and sellers of the contracts than in the spot market.

Prof. Holbrook Working of Stanford University, who is considered as the father of commodity derivative economics, and followed subsequently by Prof. Roger W Gray, Prof. B.S Yamey of London School of Economics, Prof. Ann Peck, and many others in recent years have invariably confirmed that commodity derivative trading performs the useful function of price discovery and risk management.

1.2 Statement of the Problem

Major economic functions of futures trading are hedging, competitive price discovery and reduction in price volatility. From the point of view of an economic analyst, a futures market would be perfect if it was perfectly efficient on all the three criteria: hedging efficiency, price stabilization and absence of bias. It is possible to set the standards for a perfect futures market against which actual market performance can be measured. The three criteria are clearly unattainable, but like most of the criteria of perfection in economics, their purpose is to evolve a yardstick against which the actual performance can be measured.

Several studies both in India and abroad have confirmed that seasonal and short term price variations are lower in the presence of futures trading than its absence. The true role of commodity derivative markets is to ensure stability in prices and reduce volatility. A futures market that reduces the
abnormal seasonal and intra-seasonal price fluctuations is welcomed by all the players, produces as well as consumers and even the market intermediaries. The probability of adverse price movements of agro-commodities is referred to as price risk. Risk minimizing tools like futures contracts insulate buyers and sellers from unexpected changes in futures prices and enable them to lock in the price of commodities.

The derivative market helps price discovery resulting from the overall consensus of all the known market information. The price so arrived at is not a price forecast, as is widely believed, but merely serves as a reference price for physical market transactions, for either immediate or forward delivery by market functionaries of different hues throughout the comprehensive supply chain of commodities. This reference price helps to improve the efficiency of risk management by ensuring parallel or near-parallel movements in the physical and futures market prices.

As per the recommendations of the World Bank- UNCTAD, India re-started futures trading in almost all agricultural commodities. But farmers’ participation in futures market is abysmally low because farmers’ awareness about futures market is poor. Majority of farmers were not able to access futures markets directly because they lack the critical minimum size to fulfill the contract specification (Sahadevan K.G, 2009) and (IIM, 2006). The success of futures trading depends upon effective price risk management, price discovery and reduced volatility which in turn depends upon the volume of trading. A thin market can be easily manipulated and such a market may fail to manifest the economic functions. In the case of rubber futures market volume of trading depends upon the extent of participation by market players like growers, dealers, manufacturers, rubber marketing co-operative societies and
Rubber Producer’s Societies (RPS). The extent of participation by market players has a direct bearing on their awareness level and their perception about futures trading.

In the light of the above facts and from the review of literature available on rubber futures market, it is felt that there is a necessity to study rubber futures market with specific focus to examine (1) the awareness and perception of rubber futures market participants viz. (i) growers, (ii) dealers, (iii) rubber product manufacturers, (iv) rubber marketing co-operative societies and Rubber Producer’s Societies (RPS) about futures trading and (2) whether the rubber futures market is fulfilling the economic functions of futures market viz. hedging, reduction in volatility and price discovery or not.

1.3 Objectives of the Study

The general objective of the study is to examine the economic functions of rubber futures market. The specific objectives are the following.

1) To study hedging efficiency;

2) To analyse elasticity of expectation;

3) To examine index of bias;

4) To analyse the volatility of spot price of rubber;

5) To examine whether futures trading in rubber helps in price discovery or not; and

6) To study the awareness and perception of rubber futures market participants viz. (i) rubber growers, (ii) rubber dealers, (iii) rubber product manufacturers (iv) Rubber Producers’ Societies and Rubber Marketing Co-operative Societies.
1.4 Scope of the Study

Kerala accounts for 88 per cent of the natural rubber production and 73 per cent of the area of cultivation. 85 per cent of the rubber dealers are in Kerala. 17 per cent of the manufacturers are in Kerala and all the rubber marketing co-operative societies and rubber producers’ societies are in Kerala. In the light of the above, the present study is confined to growers, dealers, rubber goods manufacturers, rubber marketing co-operative societies and RPS in Kerala.

1.5 Hypotheses

The following hypotheses are formulated for the study.

H1: There exists significant difference in the awareness about futures trading of participant and non-participant growers.

H2: There exists significant difference in the perception about futures trading of participant and non-participant growers.

H3: There exists significant difference in the awareness about futures trading of participant and non-participant dealers.

H4: There exists significant difference in the perception about futures trading of participant and non-participant dealers.

H5: There exists no significant difference in the awareness about futures trading of participant and non-participant rubber product manufacturers.

H6: There exists no significant difference in the perception about futures trading of participant and non-participant rubber product manufacturers.

H7: There exists no significant difference in the awareness about futures trading of participant and non-participant rubber marketing co-operative societies & RPS.
H8: There exists no significant difference in the perception about futures trading of participant and non-participant rubber marketing co-operative societies & RPS.

1.6 Data and Methodology

The present study is both descriptive and analytical in nature and based on both primary and secondary data.

1.6.1 Sources of Secondary Data

In order to achieve the stated objectives, the study utilized secondary data for the period from 2003 to 2013 from different published sources like bulletins, newsletters, circulars from NMCE, Reserve Bank of India (RBI), Warehousing Corporation and traders.

1.6.2 Source of Primary Data

The primary data required for this study were collected from rubber growers, rubber dealers, RPS & Rubber Marketing Co-operative Societies and rubber goods manufacturers in Kerala, to find out the awareness and perception of futures trading, participation in the futures trading, use of spot and futures prices and source of price information by dealers, farmers, manufacturers and cooperative societies. A survey was conducted among rubber growers, rubber dealers, RPS & Rubber Marketing Co-operative Societies and rubber manufacturers in Kerala.

1.6.3 Sampling Method

Sample respondents were taken from rubber growers, rubber dealers, RPS & Rubber Marketing Co-operative Societies and manufacturers. Multi stage judgment sampling method was employed to collect data from growers,
dealers and manufacturers. Judgment sampling technique was applied for taking sample from RPS & Rubber Marketing Co-operative Societies. A sample size of 500 each was taken from growers and dealers. Sample size taken from RPS & Rubber Marketing Co-operative Societies and manufacturers are 250 and 100 respectively. The number of futures market participant rubber growers, rubber dealers, RPS & Rubber Marketing Co-operative Societies and rubber manufacturers, are 26, 420, 4 and 3 respectively. The number of non participant rubber growers, rubber dealers, RPS & Rubber Marketing Co-operative Societies and rubber manufacturers are 474, 80, 246 and 97 respectively.

1.6.3.1 Population

Growers, dealers, manufacturers, rubber producers’ societies and rubber marketing cooperative societies are the rubber futures market participants. There are 12,50,000 (Twelve lakh fifty thousand) small holdings, 538 large rubber estates having area more than 20 hectares, 9533 licensed dealers, 4334 rubber goods manufacturers, 2432 rubber producers’ societies and 35 rubber marketing cooperative societies in India.

1.6.3.2 Growers

There are 12, 50,000 (Twelve lakh fifty thousand) small holdings and 538 large estates having area of more than 20 hectares in India. Multi stage judgment sampling method was employed to select sample respondents from rubber growers in Kerala. The state of Kerala was divided on the basis of districts. Kottayam, Ernakulam, Pathanamthitta and Idukki districts come on the first, second, third and fourth positions respectively on the basis of natural rubber production. Hence, these four districts are selected for collecting sample respondents. The sample respondents were taken from the growers on the
basis of plantation area. The classification of growers on the basis of area is given by Rubber Board. The sampling distribution is as follows. From growers having area, 2 hectares and below, above 2 hectares and up to and including 4 hectares, above 4 hectares and up to and including 10 hectares, above 10 hectares and up to and including 20 hectares, above 20 hectares and up to and including 40 hectares, above 40 hectares and up to and including 200 hectares, above 200 hectares and up to and including 400 hectares, above 400 hectares and up to and including 600 hectares and above 600 hectares. Sample sizes taken are 100, 300, 44, 28, 9, 12, 2, 2 and 3 respectively. From the 8 category of growers the total sample respondents taken are 500.

1.6.3.3 Dealers

Out of the 9533 licensed rubber dealers in India, 8055 dealers are in Kerala and among them 64 are major dealers. Multi stage judgment sampling method was employed to select ample respondents from dealers. Rubber dealers are spread across 25 states in India. From these states Kerala was selected and it was divided on the basis of districts. Kottayam, Kollam, Pathanamthitta and Ernakulam districts come first, second, third and fourth respectively on the basis of number of licensed dealers. Hence, these four districts are selected for collecting sample respondents from dealers. The sampling distribution of dealers shows that, the sample respondents taken from Kottayam, Kollam, Pathanamthitta and Ernakulam districts are 143, 50, 150, 150 and 7 respectively. From the traders of the above mentioned districts, the total sample respondents taken are 500.
1.6.3.4 Manufacturers

Out of the 4334 licensed rubber goods manufacturers in the country, 724 are in Kerala. Multi stage judgment sampling method was employed to collect data from manufacturers. Rubber goods are manufactured in 22 states in India. The highest number of manufacturers is in Kerala, hence, Kerala is selected. Rubber Board has divided manufacturers into 6 categories depending upon the quantity of consumption. In this study the sample respondents were selected on the basis of the quantity of consumption. The sampling distribution of manufacturers shows that from A (10 tonnes and below), B (above 10 tonnes and upto and including 50), C (above 50 tonnes and upto and including 100), D (above 100 tonnes and upto and including 500), E (above 500 tonnes and upto and including 1000) and F (above 1000 tonnes) consumption groups the sample sizes taken are 24, 30, 30, 10, 3 and 3 respectively. From all consumption group manufacturers together the total sample size taken is 100.

1.6.3.5 Co-operative Societies and RPS

Cluster groups formed among rubber farmers in India, popularly known as Rubber Producers Societies (RPS) are involved in the production of high quality grades in their group processing centres for domestic and world markets. Rubber Producers’ Societies directly purchase latex from growers and convert it into higher grades RSS 1x to RSS 3, centrifuged latex, creamed latex, etc. Rubber Marketing Co-operative Societies are rubber traders, purchase rubber both from small traders and growers. Judgment sampling technique is applied for taking sample from Co-operative societies and RPS. There are 2432 RPS and 35 Rubber Marketing Co-operative Societies in India. More than 95 per cent of the RPS and all the Rubber Marketing Co-operative Societies are in Kerala. Sample respondents of 246 RPS and 4 Rubber
Marketing co-operative societies were surveyed. The total sample size taken from both groups is 250.

1.6.4 Instruments for Collecting Primary Data

Primary data were collected using four separate sets of interview schedules developed after pilot study. The interview schedules developed for collecting data were finalized after a pilot study among 50 dealers, 50 growers, 50 manufacturers and 50 RPS & rubber marketing cooperative societies. The interview schedule developed for collecting data was administered among 500 growers, 500 dealers, 100 manufacturers and 250 rubber marketing co-operative societies and RPS.

1.6.5 Tools of Analysis of Data

Primary data collected were analysed with the help of softwares like Microsoft Excel and SPSS 17. Statistical tools like percentage, standard deviation, Chi-square test, Mann – Whitney U test, Kruskal Wallis test, Augmented Dickey – Fuller test statistic, t- statistic, Granger causality test, F- statistic, Johansen co – integration test, Trace statistic and Max –Eigen statistic. Percentage is used for demographic classification; standard deviation is used for finding volatility. Chi-square test, Mann – Whitney U test and Kruskal Wallis test are used for significance of results obtained based on the analysis. To find the price discovery, secondary data were analysed with the help of EViews 7. Augmented Dickey – Fuller test statistic uses t- statistic is used to check unit root. Granger causality test uses F- statistic used to test causality. Johansen co – integration test uses Trace statistic and Max –Eigen statistic used to test long run association- ship.
1.7 Chapter Scheme

This thesis is presented in six chapters, viz.

Chapter 1 – Introduction: It gives a brief introduction, statement of the problem, objectives to be examined, scope of the study, methodology adopted, source of data, and scheme of chapterization and limitations of the study.

Chapter 2 – Review of Literature: In this section an attempt is made to present a review of various studies relating to awareness about futures trading, benefit of futures trading, economic functions of the futures contract, hedging effectiveness, market microstructure, spread/basis, carrying cost, price stabilization/destabilization, speculation, amendment to FC (R ) Act, types of forward contract, failure of futures contract, option trading, relationship between rubber price and crude oil price, rubber plantation management, volatility of the underlying asset price, price discovery at national and international level.

Chapter 3 – Futures Trading in Rubber – An Overview: This chapter is about derivatives in India: A historical over view, definition of futures Contract, rubber futures trading in National Multi Commodity exchanges, spot price trend of rubber after delisting and underlying fundamentals, destabilization hypotheses and increased spot market volatility, stabilization hypotheses and decreased spot market volatility and Stabilizing effect of futures trading.

Chapter 4 – Economic Functions of Futures Market: An Analysis. This chapter deals with the analysis of statistical data on hedging efficiency, elasticity of expectation, market bias, Volatility of spot rubber price and price discovery.
Chapter 5 - Awareness and Perception of Market Participants: An Analysis.
This chapter presents the analysis of the statistical data on profile of futures market participants, spot price information sources and motivation for sale/purchase, awareness of market participants about spot and futures market, awareness and perception about futures trading.

Chapter 6 - Summary of Findings, Suggestions, and Conclusions: This chapter presents the summary of the thesis, briefs of various findings, recommendations, major contributions of this research and directions for future research.

1.8 Limitations of the Study

Even though, utmost care is exercised in all aspects of this research, certain limitations have been perceived and are acknowledged herewith.

- The major limitation of the study is that it does not cover the entire rubber futures market participants in Kerala.
- Hedge period less than one month has not been considered in this study.


2.1 Introduction

This chapter summarizes the major conclusions and propositions of previous research studies on commodity futures trading. The review of literature is of paramount important in any research as it offers an explanation for the necessity of the current research initiatives. The economic functions and benefits of commodity futures trading are debated in many academic literatures across the world. The review of literature helped the researcher to evaluate various studies relating to awareness about futures trading, benefit of futures trading, economic functions of the futures contract, hedging effectiveness, market microstructure, spread/basis, carrying cost, price stabilization/destabilization, speculation, amendment to FC (R) Act, types of forward contract, failure of futures contract, option trading, relationship between rubber price and crude oil price, rubber plantation management, volatility of the underlying asset price, price discovery. Majority of the Indian literature on futures trading originated after the introduction of futures trading on national level multi commodity exchanges in 2003.