# Impact of Spot Prices on FuturesMarket Prices of Agricultural Commodities in India

*Minu.M, #Dr.D.Raja Jebasingh

*Research Scholar, #Assistant Professor & Research Guide, Department of Commerce, St. Joseph's College of Commerce Research Centre, Bangalore University, Bangalore, India.

*minumuthukrishna@gmail.com, #rajajebasingh@sjcc.edu.in

**Abstract -** **Agriculture sector is the backbone of India. There are various agricultural commodities which are traded in National Commodity and Derivative Exchange and Multi Commodity Exchange in India. Agriculture commodity market is growing very effectively in India but still farmers are facing various risks and most challenging part is price risk. Analyzing the market and price behavior is the supreme problem of farmer, producer and trader. The present study focuses on the price behavior and market behavior in Indian agricultural commodity market. The study focuses on the relationship between the spot and futures prices of two agricultural commodities Cotton and Cardamom which is traded in Multi Commodity Exchange (MCX) in India during 2013-2017. The data analysis is done by using Eviews Software. Using the price data we test Stationarity Test, Granger Causality Test to empirically uncover the direction of information flows between futures price and spot prices. The study focuses on the spot price influence on futures price or vice versa. The result reflects that every commodity traded in exchange has different price effectiveness and the trader should understand the agriculture commodity market to hedge their price risk.**

**Keywords: Commodity, Commodity Exchange, Spot Market, Futures Market and Commodity Market.**

## I. INTRODUCTION

The Indian agriculture production system has come across a tremendous change in the agriculture sector after adopting new policies of government towards the price effect and technologies to enhance the production level. India has a very long history of trading in commodities. In 1875 the Bombay Cotton trade Association was formed. However, trading on futures contracts became a challenge due to price fluctuation. In 1947, major policy decisions were imposed to contribute positively to the development of the futures and forward markets in the country.In 2003 India commodity exchange was permitted to do trade in futures contracts. Commodity trading in India had extraordinary growth especially for agricultural commodities. In 2007-08 Indian government restricted trading on certain commodity as a part of its anti-Inflationary measure. Indian commodity market has advanced 50 times in a period of 5 years i.e. from INR 665 billion in 2002 to INR 33,753 billion in 2007 registered a CAGR- Compounded Annual Growth Rate.

The financial market has come across various types of challenges which improved the market to stabilize and equip the financial instrument to overcome the risk. What has actually changed is the level of risk and the hedging instruments in the financial system. There are many derivative instruments developed in the market to hedge the risk and to mitigate the risk in financial market. The trader's interest to diversify the risk has improved the derivative market. Those investors who wanted to safeguard themselves against the price fluctuation derivative market were their platform to trade. The major problem face by producer, manufacturer and trader is price fluctuation in the market. The agricultural commodity price is influenced by forces like seasonality in production, availability of inventory, demand and supply, vagaries of monsoon, availability of warehouse facilities, seasonality in consumption, export-import policies of India and peer countries, government interventions such as minimum support prices, etc. Agriculture commodity market as a volatility effect due to unbalanced market and identical products traded in the market. The reason for the price effects can be several such as catastrophes, unexpected natural, exploitation of upcoming resources, national and global political effectiveness, change in the economy and change in industry policies etc.By trading into the futures market in order to make earnings, speculators capital is required to increase liquidity in the commodity market. Futures markets allow speculators contribution in a more controlled environment where monitoring and observation of the participants is possible. Hence, futures ensure transparency. Futures also help in standardization of commodity quality, commodity quantity and time of delivery, since these variables are agreed upon by the traders and specified in the futures contract. The impact of

price volatility in agriculture commodities not only affects the producers in the agricultural sector but also on the other sectors of the economy who use agriculture commodities for their production. Commodity Exchange plays a huge role to maintain the price stability in the commodity market because price plays a huge role in commodity exchange.

## II.    REVIEW OF LITERATURE

After considering the various study done on the issues of commodity price relationship between spot and futures market. A review of the literature on the subject reveals the following:

Athma, P., & Rao, K. V. G. (2013). An attempt is made to study the temporal relationship between the Spot and the Futures prices of the Commodity Market by analyzing the data of the Comdex. Various statistical tools are used like Augmented Dickey-Fuller Test Statistic, Multiple Regression, Johansen Co-Integration Test, Vector Error Correction Model and Granger Causality Test are used to analyze the series. The study reveals that the markets are efficient in the price formation and transmission of information between futures price and spot price. The Comdex reflects that the average Futures prices are greater than the Spot prices due to the fact that the Comdex is a combination of both non-perishable commodity and perishable commodities. The Futures market showed the leadership in the markets which is noticed in the CCF plot and is also supported by the Multiple Regression where the futures had a better influence in predicting the Spot prices and similar outcomes were seen in the Vector Error Correction Model and the Granger Causality test.Aggarwal, N., Jain, S., & Thomas, S. (2014).This paper tries to examine price discovery and hedging effectiveness of the selected commodity futures and helps to manage risk very efficiently. The paper studies the viewpoint of the hedger to conjecture what factors may progress hedging effectiveness. There is a huge settlement costs caused by delivery centers and an untrustworthiness of warehouse receipts, a mismatch between the grade specified in the futures contract and the actual deliverable quality in the market etc. The data is obtained from three commodity exchanges – MCX, NCDEX, and NMCE – for the period between2003-2014. The results reflects that while the commodity futures markets perform the role of price discovery reasonably well, their role in effectively reducing the risk in commodity exposure is not as strong. There is a variation in price discovery as well as hedging effectiveness varies across commodities. However, other than for commodity like sugar and gold, the average information share (IS) of futures is steady across the full period or the more recent period after 2010.Bansal,R., Dadhich,V., & Ahmad,N. (2014). The study presents an overview of the Indian commodity market. The present study focuses on the development and performance of the

commodity market. The study reveals that Indian commodity markets have recently thrown open a new avenue for traders to participate commodity derivatives. For that trader who wants to diversify their portfolios beyond shares, bonds and real estate, commodities are the best option. For investors could have done very little to actually invest in commodities such as gold and silver or oilseeds.Bhagwat, D. S., Maravi, A., Omre, R., & Chand, D. (2015). The study focus on agro-based commodity markets. The main purpose of this study is to know current scenario of commodity futures market in India. The commodity market provides trading to trade commodities of varied types. This present study reveals to which extent the commodity policies and regulatory framework. The current progress India will soon emerge as a major player in the international market in terms of commodity consumption, production and trade. After gaining the considerable reputation, the major commodity exchanges in India has started the futures contract in various commodities year back, which can serve preferably to hedge the risk due to adversity of expected prices of commodities besides the price discovery tool. The futures contracts trade in major commodity exchanges are standardize in nature. In this paper they examine the commodity futures market in India, taking into consideration the history of commodity futures market. And after that it has discussed the mechanism of trading, segments and regulatory framework of commodity market in India. The data is collected through secondary source. Secondary data collected from books, journals, and magazines websites of Forward Market Commission.Guglani, R. K. (2016).This study tries to understand the price and quantity volatility of selected agricultural commodities in Indian market and underline the factors responsible for such fluctuations, the factors responsible for price fluctuations in the spot and futures markets and to examine the price discovery mechanism through regional exchanges and their correlation with the national level commodity exchanges. It is thus not unimportant to point out that the futures markets provide a platform for risk mitigation, price discovery, arbitrage and clearing and settlement. It has been observed that the stakeholders, namely, the farm producers, consumers, processors and traders hedge their positions in the commodity futures with the intention of protecting themselves from the risks of likely adverse price changes in agricultural commodities. The information pertains to selected futures contacts spread over the period of four years between 2006 and 2009. The study noted that the price dissemination and reduction in price volatility could be seen during the expiration periods of the basmati rice futurestraded in Indian commodity markets. Moreover, in the Indian context, the non-price measures such as providing basic infrastructure, support and extension services along with adequate credit for increasing agricultural output are far more important in relation to the

minimum support prices and other incentives including subsidies.Rajan, Hariharan and Reddy, K. (2018).Commodity market is a market which involves buying and selling of Hard and soft commodities. Commodity market exists more than a century.India has experienced impressive progress in the commodity derivatives markets since 2003. After Government approval for operation of multiple exchanges, the exchange environment has become highly competitive market for product development and business strategies. Private sector initiatives, seeking to tap the potential value of agricultural trading, have become key promoters in this process.Jena, P. K. (2016).This paper made an attempt to empirically examine the financialization of Commodity market in India The paper analyses the role of speculation in commodity markets and the relationship between stock prices and commodity price. This study uses monthly data for both commodity price and stock price from the period January 2001 to June 2012 (i.e., sample period is 138 months) for which time series techniques is used. The analysis reveals that commodity index price is highly associated with the stock index price during the study period. The causality test reveals that commodity price Granger causes to the stock price in India. This study empirically examines the commodity markets in India by using the time series techniques of causality test and the volatility spillover testsThe present study reveals that the relationship of stock price with commodity price, it is found that average stock price return was more than the commodity price return, but compared to the commodity price volatility, the stock price was more volatile than commodity price. The unconditional correlation test, expresses that commodity price indices were highly correlated with the stock prices in three periods. Therefore, there is no strong evidence on the financialisation of commodity markets in India..Kaur, H. P., & Anjum, B. (2013). Agricultural commodity futures in India-a literature review. The purpose of this paper is to provide an overview of Agricultural Commodity Futures in India by taking into account the variability of empirical results of some selected studies on agricultural commodity futures. This paper is based on review of empirical results of studies on agricultural commodity futures for the 2001-2013 periods. These studies have been classified in three sections: Growth and performance of the commodity futures market, relationship between agricultural commodity futures market and spot market and price risk management through agricultural commodity futures. The paper shows the growth in commodity futures market along with identification of problems that are affecting the performance of agricultural commodity futures in India.

## III.    OBJECTIVES OF THE STUDY

Following are the research objectives:

➤ To examine the stationarity of spot and futures market for selected agriculture commodities in Multi Commodity Exchange (MCX) India.

➤ To analyze the direction of causality between agricultural commodity futures and spot markets in MCX India.

➤ To examine the long term relationship between the spot and the futures prices of selected commodities traded in MCX.

## IV.    HYPOTHESIS OF THE STUDY

Long term relationship between futures price and spot price of commodities traded in Multi Commodity Exchange (MCX) India.

➤ $H_0 1$: There is no cointegration between futures prices and spot price of Cotton
➤ $H_a 1$: There is cointegration between futures prices and spot price of Cotton
➤ $H_0 2$: There is no cointegration between futures prices and spot price of Cardamom
➤ $H_a 2$: There is cointegration between futures

Lead-lag relationship between futures price and spot price of commodities traded in Multi Commodity Exchange (MCX) India.

➤ $H_0 3$: The futures prices of Cotton does not granger cause spot prices of Cotton in MCX
➤ $H_a 3$: The futures prices of Cotton does granger cause spot prices of Cotton in MCX
➤ $H_0 4$: The futures prices of Cardamom does not granger cause spot prices of Cardamom in MCX
➤ $H_a 4$: The futures prices of Cardamom does granger cause spot prices of Cardamom in MCX

## V.    THE DATA

Agricultural commodity is traded in MCX (Multi Commodity Exchange). The commodity which does not have break in trading for more than 3 months is been considered for the study. On this basis two commodities has been selected from MCX (Multi Commodity Exchange). The data is retrieved from Multi Commodity Exchange (MCX) website two commodities are considered for the present study (Cotton and Cardamom traded in MCX).A sample detail has been given in below table1.

Table 1: Sample Details of Commodities

| TABLE 1 | | | | |
|---|---|---|---|---|
| Sl. No. | Market Selected | Product Traded At | Sample Product | Sample Period |
| 1 | Fiber | MCX | Cotton | January 2013- December 2017 |
| 2 | Spice | MCX | Cardamom | January 2013- December 2017 |

Agriculture sector is the cornerstone of Indian economy, being watched keenly by not only the policy makers but also by business and industry, and the academia. The Directorate of Economics and Statistics caters by annually publishing *"Agricultural Statistics at a Glance"*. Over the years, this publication has become a trusted source of reference to people and organizations dealing with agricultural economy (Table 2).

| Table 2 All India Index Numbers of Area, Production, Yield and Terms of Trade | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Crops | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17* |
| | Farmers | Agricultural Labourers | Index of Prices Received (IPR) | Farmers | Agricultural Labourers | Combined Index for Final Consumption (IPP-FC) | Intermediate Consumption (IPP-IC) | Capital Formation (IPP-CF) | Combined Index for Prices Paid (IPP) | Index of Terms of Trade (ITT) |
| Weight→ | 94.04 | 5.96 | 100 | 71.35 | 28.65 | 55.38 | 25.62 | 19 | 100 | Col-4/10*100 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Cotton | 103.7 | 103.6 | 111.6 | 123.8 | 134.1 | 131.9 | 131.7 | 141.2 | 135.4 | 119.5 |
| Cardamom | 89 | 100.1 | 97.9 | 94.6 | 94.6 | 100.1 | 101.2 | 108.8 | 93.5 | 92.5 |
| Source: Directorate of Economics & Statistics, DAC&FW | | | | | | | | | | |
| * As per 4th Advance Estimates. | | | | | | | | | | |

## VI.    ECONOMETRIC MODELS

➤ UNIT ROOT TEST

The time series data is collected from the Multi Commodity Exchange. After the statistical process the stationarity of historical data is derived from time plots and correlogram. While using ADF (Augmented Dickey-Fuller) and Phillips-Perron (PP) non parametric teston both the commodities Cotton and Cardamom (Spot price and Futures price) traded in MCX found that are unit root or non-stationary at level, the data is stationary at first difference which satisfies all the 3 Equation of stationarity test I(1) Table 3&4.

$\Delta Y_t = B_1 + ZY_{t-1} + a_i + e_t$ (Eq. 1) >Intercept Only

$\Delta Y_t = B_1 + B_2 t + ZY_{t-1} + a_i + e_t$ (Eq. 2) >Trend and Intercept

$\Delta Y_t = ZY_{t-1} + a_i + e_t$ (Eq. 3) >No Trend, No Intercept

| Table3: The result of Augmented Dickey-Fuller (ADF) for first order differenced series of Cotton and Cardamom (Spot and Futures Prices) by using Eviews software. | | | | | | |
|---|---|---|---|---|---|---|
| Commodity | Exogenous | Variable | Coefficient | Std. Error | t-Statistic | Prob. At 5% significance level. |
| Cotton Spot | Constant | DSPOT_PRICES(-1) | -0.661948 | 0.033533 | -19.74046 | 0.0000 |
| Cotton Spot | Constant, Linear Trend | D(SPOT_PRICES(-1)) | -0.662123 | 0.033549 | -19.73611 | 0.0000 |
| Cotton Spot | None | D(SPOT_PRICES(-1)) | -0.661524 | 0.033513 | -19.73948 | 0.0000 |
| Cotton Futures | Constant | D(DFUTURES_PRICES(-1) | -1.17763 | 0.083489 | -14.10522 | 0.0000 |
| Cotton Futures | Constant, Linear Trend | D(DFUTURES_PRICES(-1)) | -1.17809 | 0.083533 | -14.10322 | 0.0000 |
| Cotton Futures | None | D(DFUTURES_PRICES(-1)) | -1.176873 | 0.083437 | -14.10499 | 0.0000 |
| Cardamom Spot | Constant | DSPOT_PRICES(-1) | -0.873634 | 0.038312 | -22.80301 | 0.0000 |
| Cardamom Spot | Constant, Linear Trend | D(SPOT_PRICES(-1)) | -0.874211 | 0.038336 | -22.80365 | 0.0000 |

| Cardamom Spot | None | D(SPOT_PRICES(-1)) | -0.873606 | 0.038297 | -22.8112 | 0.0000 |
|---|---|---|---|---|---|---|
| Cardamom Futures | Constant | D(DFUTURES_PRICES(-1) | -18.61966 | 1.172318 | -15.88278 | 0.0000 |
| Cardamom Futures | Constant, Linear Trend | D(DFUTURES_PRICES(-1)) | -18.62852 | 1.172873 | -15.88282 | 0.0000 |
| Cardamom Futures | None | D(DFUTURES_PRICES(-1)) | -18.61949 | 1.171848 | -15.88899 | 0.0000 |

| Table4: The result of Phillips-Perron Test (PP) for first order differenced series of Cotton and Cardamom (Spot and Futures Prices) by using Eviews software. | | | | | | |
|---|---|---|---|---|---|---|
| Commodity | Exogenous | Variable | Coefficient | Std. Error | t-Statistic | Prob. At 5% significance level. |
| Cotton Spot | Constant | DSPOT_PRICES(-1) | -0.727157 | 0.026839 | -27.09366 | 0.0000 |
| Cotton Spot | Constant, Linear Trend | D(SPOT_PRICES(-1)) | -0.727269 | 0.026850 | -27.08618 | 0.0000 |
| Cotton Spot | None | D(SPOT_PRICES(-1)) | -0.726866 | 0.026826 | -27.09561 | 0.0000 |
| Cotton Futures | Constant | D(DFUTURES_PRICES(-1) | -1.775954 | 0.017651 | -100.614 | 0.0000 |
| Cotton Futures | Constant, Linear Trend | D(DFUTURES_PRICES(-1)) | -1.775995 | 0.017657 | -100.5821 | 0.0000 |
| Cotton Futures | None | D(DFUTURES_PRICES(-1)) | -1.775914 | 0.017645 | 0.017645 | 0.0000 |
| Cardamom Spot | Constant | DSPOT_PRICES(-1) | -0.948582 | 0.027848 | -34.06233 | 0.0000 |
| Cardamom Spot | Constant, Linear Trend | D(SPOT_PRICES(-1)) | -0.948947 | 0.027860 | -34.06097 | 0.0000 |
| Cardamom Spot | None | D(SPOT_PRICES(-1)) | -0.948571 | 0.027838 | 0.027838 | 0.0000 |
| Cardamom Futures | Constant | D(DFUTURES_PRICES(-1) | -1.855604 | 0.014441 | 128.4993 | 0.0000 |
| Cardamom Futures | Constant, Linear Trend | D(DFUTURES_PRICES(-1)) | -1.856017 | 0.014427 | -128.6483 | 0.0000 |
| Cardamom Futures | None | D(DFUTURES_PRICES(-1)) | -1.855583 | 0.014436 | -128.539 | 0.0000 |

## ➢ GRANGER CAUSALITY TEST

The researcher might be interested in knowing whether changes in one variable cause changes in another variable. This question is clarified with the help of causality tests. Let $Y_t$ be a two-dimensional vector $(y1t, y2t)'$. If history of y1t is helpful in predicting y2t, it is said that y1t causes y2t. Similarly, if past information about y2t is useful for predicting y1t, then y2t is said to granger cause y1t. Whether Futures prices causes Spot prices or Spot prices causes the futures prices for the selected commodities Cotton and Cardamom traded in MCX (Table 5).

| TABLE 5: Pairwise Granger Causality Tests for Cotton and Cardamom Futures and Spot prices, Sample: 1/01/2013 12/29/2017, Lags: 6 and 8 respectively | | | | | | |
|---|---|---|---|---|---|---|
| Commodities | | Cotton | | | Cardamom | |
| Null Hypothesis: | Obs | F-Statistic | Prob. | Obs | F-Statistic | Prob. |

| DSPOT_PRICES does not Granger Cause DFUTURES_PRICES | 1282 | 0.83740 | 0.5409 | 1280 | 1.70461 | 0.0929 |
|---|---|---|---|---|---|---|
| DFUTURES_PRICES does not Granger Cause DSPOT_PRICES | 1282 | 0.95469 | 0.4548 | 1280 | 1.67911 | 0.0990 |

➤ COINTEGRATION AND ERROR CORRECTION MODEL

This analysis shows the long term equilibrium relationship between the spot price and futures price for the selected commodities. Since spot and futures price represent the prices of same commodity they are expected to be cointegrated. The study uses Johansen's cointegration test considering Trace statistic and Max-Eigen statistic. Johansen cointegration test for general VAR model at series I(1) Table4:

$$Ak(L)xt = \mu0 + \Psi Dt + \varepsilon t$$

The VAR in levels can be transformed to a vector error correction model (VECM)

$$\Delta xt = \Gamma 1 \Delta xt-1 + ... + \Gamma k-1 \Delta xt-k-1 + \Pi xt-1 + \mu0 + \Psi Dt + \varepsilon t.$$

Johansen cointegration test can be applied through the *k*th order VECM represented as:

$$\Delta xt = k\ X-1\ i=1\ \Gamma i \Delta xt-i + \Pi xt-1 + \mu0 + \Psi Dt + \varepsilon t.$$

| TABLE 6:  Johansen Cointegration Tests for Cotton and CardamomFutures and Spot prices, Sample: 1/01/2013 12/29/2017. | | | | | | |
|---|---|---|---|---|---|---|
| Commodities | Cotton | | | Cardamom | | |
| Hypothesized No. of CE(s) | Trace Statistic | 0.05 Critical Value | Prob. | Trace Statistic | 0.05 Critical Value | Prob. |
| None * | 470.1297 | 15.49471 | 0.0001 | 466.7275 | 15.49471 | 0.0001* |
| At most 1 | 144.6425 | 3.841466 | 0.0000* | 181.342 | 3.841466 | 0.0000* |
| Hypothesized No. of CE(s) | Max-Eigen Statistic | 0.05 Critical Value | Prob. | Max-Eigen Statistic | 0.05 Critical Value | Prob. |
| None * | 325.4872 | 14.26460 | 0.0001 | 285.3855 | 14.2646 | 0.0001* |
| At most 1 | 0.106615 | 144.6425 | 0.0000* | 181.342 | 3.841466 | 0.0000* |
| * Denotes rejection of the hypothesis at the 0.05 level | | | | | | |

RESULTS AND DISCUSSION

The result of ADF and PP reflects that the Cotton Spot price and futures prices are non-stationary at level but stationary at first difference at 5% significance level. However the Null Hypotheses (the Spot price and futures price of Cotton is not stationary) is rejected as the probability is 0.000 which means it's less than the significance level 0.05 or 5% and the alternative hypotheses is accepted i.e. Cotton-Spot and futures price is stationary.

Graph 1- Stationary at First difference 1(Cotton)
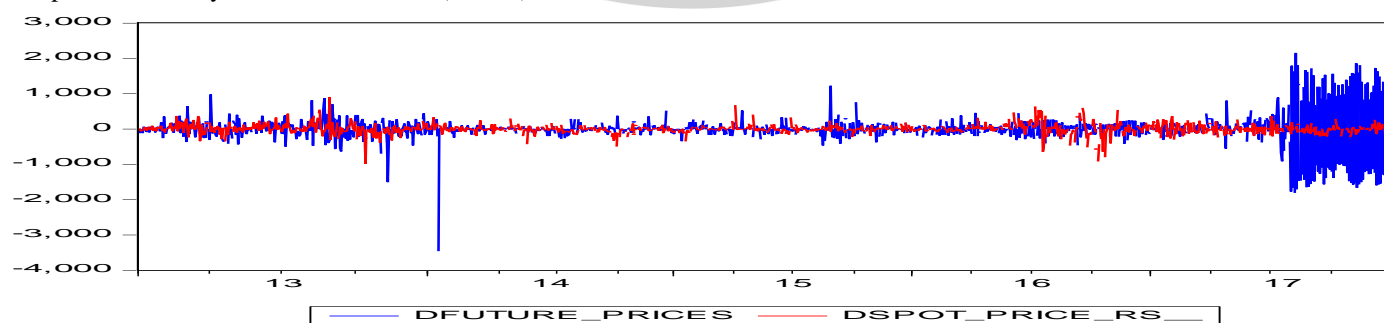


The result of ADF and PP reflects that the Cardamom Spot price and futures prices are non - stationary at level but stationary at first difference at 5% significance level. However the Null Hypotheses (the Spot price and futures price of Cardamom is not stationary) is rejected as the probability is 0.000 which means it's less than the significance level 0.05 r 5%   and the alternative

hypotheses is accepted i.e. Cardamom-Spot and futures price is stationary. Cardamom Futures and Spot price is stationary at first difference.

Graph 2- Stationary at First difference 2(Cardamom)
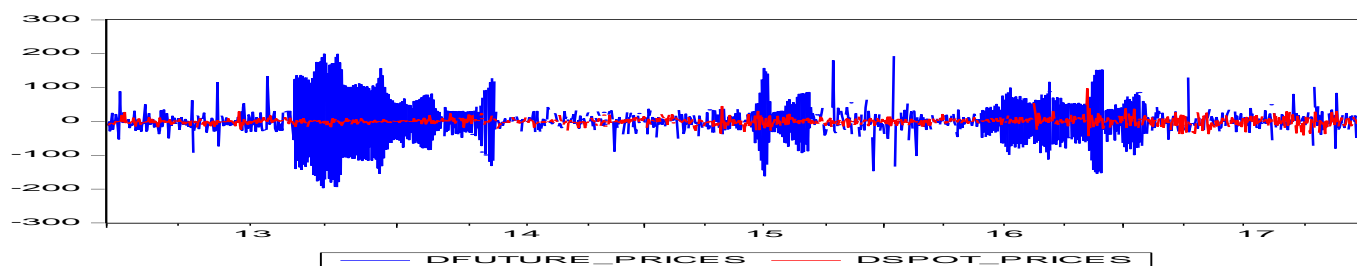


Granger Causality test is to how the relationship between the spot and futures price. The Cotton futures price Null hypotheses (DFUTURES_PRICES does not Granger Cause DSPOT_PRICES) is not rejected as the probability value is 0.4548 which is higher than 0.05 significance level and the Null hypotheses (DSPOT_PRICES does not Granger Cause DFUTURES_PRICES) is 0.5409 which accepts the Null. That means the data futures price depends on its own past and spot price depends on own past they don't influence each other.

The result shows that the Cardamom Spot price-Null hypotheses (DSPOT_PRICES does not Granger Cause DFUTURES_PRICES) are not rejected as the probability value is 0.0929 which is higher than 0.05 or 5% significance level. The Cardamom futures price Null hypotheses (DFUTURES_PRICES does not Granger Cause DSPOT_PRICES) is not rejected as the probability value is 0.0990 which is higher than 0.05 significance level. That means the data futures price depends on its own past and spot price depends on own past they don't influence each other. The Cardamom Spot price-Null hypotheses (DSPOT_PRICES does not Granger Cause DFUTURES_PRICES) are not rejected as the probability value is 0.8870which is higher than 0.05 or 5% significance level.

Johansen cointegration and Vector Error Correction tests which show that there is long run relationship between the spot and futures price for Cardamom. Johansen cointegration both the test rejects null hypotheses and accepts the alternative hypotheses that both spot and futures market are cointegrated. The analysis also reflects that Cotton Spot price and futures price has long run causality which means both spot and futures market moves together.

## VII. CONCLUSION

The commodity futures market in India has skilled in great way to compete in the global market. Commodity exchange plays an important role in the price discovery process. The present study explains the cointegration between the spot and futures for the selected agricultural commodities. The study reveals that futures market can be effective tool for hedging and to mitigate risk.

There are some bottlenecks inherent in the present study. The study period was limited from 1st January 2013 to 31st December 2017. Further, the number of commodities was limited to only two from only one national commodity exchange. Finally, data availability was a major issue; the data that was available was in some cases recorded once, and in other cases recorded twice daily. Therefore, only the prices which were nearest to the closing time were chosen.

Commodity Futures market is able to forecast futures spot price with a fair amount of correctness taking into account current and futures scenarios at least two months ahead unlike spot market, pointing out that futures market plays a pivotal role in price discovery for futures contracts. Thus, it can be inferred that overall futures market is efficient in discovering prices and in maintaining long-run equilibrium relationship with the cash market.

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