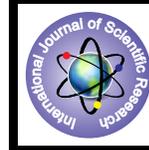# Future Trading of Agricultural Commodities in India

Agriculture

KEYWORDS :

Shende, N. V — Associate Professor, Agricultural Economics & Statistics Section College of Agriculture, Nagpur

S. A. Siranje

INTRODUCTION

The commodity markets have occupied a very important place in the economic growth and progress of countries. The concept of organized trading in commodities evolved in the middle of the 19th century.

The farmers (sellers) and dealers (buyers) started committing to exchange the produce for cash in future. This is how the contract for "futures" trading evolved where by the producer would agree to sell his produce (wheat) to the buyer at a future date at an agreed upon price. In this way, the farmer knew in advance about what payment he would receive, and the dealer knew about his costs involved. This arrangement was perceived beneficial to both sellers and buyers. These contracts became popular very quickly and started changing hands even before the delivery date.

Commodity futures trading in India is almost as old as that in the United States. India's first organized futures market was the Bombay Cotton Trade Association Ltd., which was set up in 1875. Futures trading in oil seeds started with the setting up of Gujarati Vyapari Mandali in 1900. Gold futures trading began in Mumbai in 1920. During the first half of the 20th century, there were several commodity exchanges trading in jute, pepper, turmeric, potatoes, sugar, etc.

Currently, there are three major National Level Commodity Exchanges and 21 regional exchanges operating in India. The national exchanges include National Multi-Commodity Exchange of India Limited (NMCE), Multi Commodity Exchange of India limited (MCX) and National Commodity and Derivatives Exchange Limited (NCDEX), which have been working since 26th November 2002, 10th November 2003 and 15th December 2003 respectively.

In India, futures trading is now allowed in more than 100 commodities. Most of these allowable commodities are traded through various exchanges in India. Indian economy is directly and indirectly dependent on agricultural produce. The agricultural commodity market already has measure share and with the availability of futures trading on national commodity futures exchanges will provide more liquidity, price discovery and better risk management opportunities Currently, national Commodity Exchanges are also inviting new streams of investors for new trading and business opportunities for diversification. It necessitates national commodity futures exchanges to provide price discovery, better investment opportunities and prudent risk management practices. Considering the importance of future trading in India, the study have broad objective, to analyze the performance of agricultural commodities traded across the national level commodity exchanges in India.

METHODOLOGY

The present study was conducted with respect to all three National Level Commodity Exchanges in India, namely National Multi-Commodity Exchange of India, (NMCE) Ahmadabad, which started trading in November 2002, and the other two national Exchanges viz. Multi Commodity Exchange of India Ltd

(MCX) Mumbai and National Commodity and Derivatives Exchange Ltd (NCDEX) Mumbai which started trading in November 2003. These exchanges are playing very important role in the trading activities in India.

For the present study, three major agricultural commodities currently traded in the commodity exchanges were selected. They were black pepper, gram (channa) and turmeric. These crops were selected based on their volume of trade in respective commodity exchanges. Secondary data on futures price, spot prices, and volume, value of trade on exchanges were collected from the official web site of Forward Market Commission (FMC), Mumbai and respective web sites of the National Level Commodity Exchanges in India for the period 2004-05 to 2013-14.

Analytical tool

For the purpose of accomplishing the objectives of the study, data were analyzed using the following techniques.

Growth rate analysis

The compound growth rate of volume and value of selected commodity was estimated to study the growth. It was estimate with the following exponential model.

$Y = ab^t$
Where,

Y = volume / value of selected commodity
a = Intercept
t = Corresponding year
b = Coefficient

CGR= [Antilog (logb-1)] ×100

The t test was applied to test of significance of 'b'

Instability analysis

To measure the instability of volume and value of selected commodity, coefficient of variation was used. The coefficient of variation (CV) will be calculated by the formulae.

$$C.V.(\%) = \frac{\text{Standerd Deviation}}{\text{Mean}} \times 100$$

Correlation coefficient

For achieving the objectives of study i.e. to study the relationship between spot and future prices, the method of correlation was used. The correlation is the measure of degree of relationship among the two different variables; here we are dealing with two variables i.e. spot and future prices.

RESULTS AND DISCUSSION

Growth performance

In this study, the growth rate of Gram, Black pepper and Turmeric in different commodity exchanges were estimated using compound growth rate as indicated in the methodology chapter. In this analysis, the general growth performances of the Gram, Black pepper and Turmeric in different commodity exchanges were examined by fitting exponential growth function with time normalization on volume, value, spot price and future price. The growth performance of the crop pertaining to three different exchanges is discussed separately as under. The fluctuation in the

growth rate of commodities was due to interest of buyers and sellers in different commodity exchanges.

Table:1 Commodity exchange wise compound growth rate for different commodities.

Name of the Commodity	Particular	NCDEX	NMCE	MCX
Gram	Quantity trade	2.63** (0.04)	25.90** (0.12)	42.91** (0.21)
	Turnover	9.75** (0.41)	12.90** (0.12)	10.08** (0.68)
	Spot price	5.48** (0.01)	5.06** (0.10)	2.42** (0.02)
	Future price	7.22** (0.01)	7.75** (0.01)	12.83** (0.01)
Black pepper	Quantity trade	-8.34 (0.06)	-3.20 (0.07)	-1.11 (0.40)
	Turnover	-0.38 (0.52)	-4.74 (0.70)	13.34** (0.79)
	Spot price	24.03** (0.01)	13.56** (0.01)	24.04** (0.02)
	Future price	23.67** (0.01)	23.49** (0.01)	15.94** (0.02)
Turmeric	Quantity trade	-1.52 (0.04)	60.86** (0.94)	-1.82 (0.75)
	Turnover	12.23** (0.37)	8.51** (0.78)	12.48** (2.14)
	Spot price	13.52** (0.02)	20.12** (0.02)	6.57** (0.01)
	Future price	14.24** (0.02)	14.93** (0.02)	45.83** (0.07)

(**Figure in the parentheses indicates standard error**)
Note: * Significant at 5% level.   ** Significant at 1% level.

The growth performance of Gram pertaining to three commodity exchanges was presented in the table 1 and the result revealed that, the lowest increasing trend for quantity trade, turnover and future price was recorded in NCDEX i.e. 2.63 per cent per annum, 9.75 per cent per annum and 7.22 per cent per annum respectively. However, the highest increasing trend for Quantity trade and future price was recorded in MCX i.e. 42.91 per cent per annum and 12.83 per cent per annum respectively. Statistically, all commodity exchanges pertaining to quantity trade, turnover, spot price and future price shows significance at 1 per cent level.

The growth performance of black pepper pertaining to three commodity exchanges was presented in the table 1 and the result revealed that, the lowest increasing trend for quantity trade, turnover and spot price was recorded in NMCE i.e. -3.20 per cent per annum, -4.74 per cent per annum and 13.56 per cent per annum respectively. However, the highest increasing trend for turnover and spot price was recorded in MCX i.e. 13.34 per cent per annum and 24.04 per cent per annum respectively. Statistically, all commodity exchanges pertaining to spot price and future price shows significance at 1 per cent level. However, for quantity trade and turnover NMCE shows non-significance.

The growth performance of turmeric pertaining to three commodity exchanges was presented in the table 1 and the result revealed that, the highest increasing trend in quantity trade and turnover was recorded in NMCE and MCX i.e. 60.86 per cent per annum and 12.48 per cent per annum respectively. However, the lowest increasing trend in spot price and future price was recorded in MCX and NCDEX i.e. 6.57 per cent per annum and 14.24 per cent per annum respectively. Statistically, all the commodity exchanges pertaining to quantity trade, turnover, spot price and future price of all commodity exchanges shows significance at 1 per cent level except NCDEX and MCX for quantity trade, which shows non-significance.

Instability

One should not obvious of instability by taking the growth rates only. Because the growth rates will explain only the rate of growth over the period, whereas, instability will Judge, whether the growth performance is stable or unstable for the period for the pertinent variable. To facilitate better understanding of the magnitude and pattern of changes in the level of Quantity trade, turnover, spot price and future price in different commodity exchanges of different commodities have been worked out as per discussed in chapter iii.   Methodology.

In order to know the instability in Quantity trade, turnover, spot price and future price of different commodities, the fluctuation measured with the help of coefficient of variation. Fluctuation in Quantity trade, turnover, spot price and future price was due to the variation in demand and supply of the commodities, which cause upward and downward bios in coefficient of variation.

Table: 2 Commodity exchange wise instability for different commodities.

Name of Commodity exchange	Particular	NCDEX	NMCE	MCX
Gram	Quantity trade	68.83	56.74	71.33
	Turn over	66.98	81.68	67.51
	Spot price	23.96	18.51	11.83
	Future price	27.31	26.59	20.23
Black pepper	Quantity trade	8.41	9.16	11.87
	Turn over	52.19	8.21	13.39
	Spot price	60.77	5.95	38.38
	Future price	29.62	7.29	30.91
Turmeric	Quantity trade	46.12	65.54	14.45
	Turn over	62.42	45.11	13.62
	Spot price	54.21	58.16	12.84
	Future price	56.24	56.56	11.73

The instability in gram pertaining to three commodity exchanges was presented in the table 2 and the result revealed that, coefficient of variation for quantity trade was more in MCX i.e 71.33 per cent per annum as compared to NCDEX (68.83 per cent per annum) and NMCE (56.74 per cent per annum). For spot price and future price NCDEX observed highest coefficient of variation i.e. 23.96 per cent per annum and 27.31 per cent per annum respectively. However, the lowest coefficient of variation for spot price and future price was recorded in MCX i.e 11.83 per cent per annum and 20.23 per cent per annum respectively.

The instability in black pepper pertaining to three commodity exchanges was presented in the table 2 and the result revealed that, coefficient of variation for quantity trade was more in MCX i.e 11.87 per cent per annum as compared to NMCE (9.16 per cent per annum) and NCDEX (8.41 per cent per annum). For turnover and spot price NCDEX observed highest coefficient of variation i.e. 52.19 per cent per annum and 60.77 per cent per annum respectively. However, the lowest coefficient of variation for spot price and future price was recorded in NMCE i.e 5.95 per cent per annum and 7.29 per cent per annum respectively.

The instability in turmeric pertaining to three commodity exchanges was presented in the table 2 and the result revealed that, coefficient of variation for quantity trade was more in NMCE i.e 65.54 per cent per annum as compared to NCDEX (46.12 per cent per annum) and MCX (14.45

per cent per annum). For spot price and future price NMCE observed highest coefficient of variation i.e. 58.16 per cent per annum and 56.56 per cent per annum respectively. However, the lowest coefficient of variation for quantity trade, turnover, spot price and future price was recorded in MCX i.e 14.45 per cent per annum, 13.62 per cent per annum, 12.84 per cent per annum and 11.73 per cent per annum respectively.

Relationship between spot and future prices
The correlation is the measure of degree of relationship between the two variables. In this study we considered spot price and future price as the variable and the result revealed that, all the three commodity exchanges pertaining to Gram, Black pepper and Turmeric shows positive correlation between spot price and future price. The result revealed that, the relationship between spot price and future price of all commodities were stronger in NCDEX than other commodity exchanges i.e. almost equal to one, it indicates that we assure in advance that in future he will get at least spot price i.e. not less than spot price. Table 3 is indicative of relationship between spot price and future price of all gram, black pepper and turmeric among different commodity exchanges.

Gram shows highest correlation coefficient between spot price and future price in NCDEX and the lowest in MCX i.e. 0.80 and 0.32 respectively. Black pepper shows the highest correlation coefficient between spot price and future price in NCDEX and the lowest in NMCE i.e. 0.92 and 0.25 respectively. Turmeric shows highest correlation coefficient between spot price and future price in NCDEX and the lowest in MCX i.e. 0.91 and the lowest in NMCE i.e. 0.37 respectively. The positive correlation between spot price and future price indicates that as the spot prices increases the future prices also increases.

Table: 3 Commodity exchanges wise coefficient of correlation of spot price and future price for different crops.

Name of Commodity exchange	Correlation between spot price and future price		
	Gram	Black pepper	Turmeric
NCDEX	0.80	0.90	0.91
NMCE	046	0.25	0.52
MCX	0.32	0.37	0.37

Relationship of future prices for commodities among different commodity exchanges

The table 4 represents the Correlation matrix of future prices of gram among the different commodity exchanges. The result revealed that, the highest correlation coefficient of future prices was observed in NCDEX and NMCE i.e. 0.75 and the lowest correlation coefficient of future prices was estimated in MCX and NMCE i.e. 0.36.

The table 4 represents the Correlation matrix of future prices of black pepper among the different commodity exchanges. The result revealed that, the highest correlation coefficient of future prices was observed in NCDEX and NMCE i.e. 0.84 and the lowest correlation coefficient of future prices was estimated in MCX and NCDEX i.e. 0.41.

The table 4 represents the Correlation matrix of future prices of Turmeric among the different commodity exchanges. The result revealed that, the highest correlation coefficient of future prices was observed in MCX and NMCE i.e. 0.76 and the lowest correlation coefficient of future prices was estimated in MCX and NCDEX i.e. 0.38.

Table: 4 Correlation matrix of future prices of commodities among different commodity exchanges

Namer of Commodity	Name of Commodity Exchange	NCDEX	NMCE	MCX
Gram	NCDEX	1	0.75	0.45
	NMCE	0.75	1	0.36
	MCX	0.45	0.36	1
Black pepper	NCDEX	1	0.84	0.41
	NMCE	0.84	1	0.67
	MCX	0.41	0.67	1
Turmeric	NCDEX	1	0.66	0.38
	NMCE	0.66	1	0.76
	MCX	0.38	0.76	1

Conclusions
1) The compound growth rates for quantity trade and turnover for almost all commodities has positive in all the commodity exchanges in India.

2) The compound growth rates for quantity trade in gram were positive and in black pepper were negative for all the commodity exchanges. In Turmeric the compound growth rate was negative i.e. -1.52 per cent per annum and -21.82 per cent per annum in NCDEX and MCX respectively.

3) The instability in quantity trade, turnover, spot price and future price for all commodities were observed in all commodity exchanges. It may be because the crop largely depends on several natural processes such as seasonal cycles based on harvests, monsoons, other weather events and variation in demand and supply of the commodities.

In terms of quantity trade highest instability was noted in quantity trade of turmeric in MCX i.e. 65.54 per cent per annum in relation to other commodity exchanges.

5) The correlation between spot price and future price of all commodities are positive under all the commodity exchanges. However, the correlation coefficient between spot price and future price of NCDEX were very close to one. It indicates that we assure in advance that in future he will get at least spot price i.e. not less than spot price.

Implications
1) As majority of Indian farmers are not aware of organized commodity market. Many of them have wrong impression about commodity market in their minds. It makes them specious towards commodity market. Concerned authorities have to take initiative to make commodity trading process easy and simple. Along with Government efforts, NGO's should come forward to educate the people about commodity markets and to encourage them for investment in future trading.

2) An increased effort is made to encourage the use of the futures market through public sensitization and training. This will reduce agricultural income risk. Participants of the national exchanges can adequately use past prices or current futures prices to predict the future spot prices and make informed decisions about their time and point of sale or purchase, depending on the commodities basis.

REFERENCE
Aviral, C. and A. B. David, 2005. Price Discovery in the Black Pepper Market in Kerala, India. Indian Economic Review. 40(1):1-21. | Baharumshah, A. Z. and M. S. Habibullah, 1994. Price efficiency in pepper markets in Malaysia: A Co-integration analysis. Indian Journal of Agricultural Economics. 49(2): 205-216. | Gupta, S. and R. A. Mueller, 1982. Inter- temporal pricing efficiency in agricultural markets: The case study of slaughter hogs in West Germany. European Review of Agricultural Economics. 9(1): 2- | Sinharoy, S. and S. R. Nair, 1994. International trade and pepper price variations: A cointegration approach. Indian Journal of Agricultural Economics. 49(3): 417-425. | Srinivasan, H. K. 1997. Organizational and management effectiveness of market committee and regulated markets. Indian Journal of Agricultural marketing. 2(1): 103-107. | Zelda, A. 2013. A Study of the Efficiencies of Maize and Wheat Futures Markets in India. Journal of Agriculture and Veterinary Science. 2(4): 9-14. |