



A PERCEPTIONAL STUDY ON MAIZE FUTURES CONTRACT

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Abstract: This study has undertaken to study and analyse the perception of stakeholders on maize futures contract. Using primary data, through questionnaire collected data have been analysed using SPSS package. Results showed highlights on the perceptual differences among the stakeholders and in turn, discussed on how it is been influencing on the performance of maize futures market.

Key points: Maize contract, traders, hedgers and speculators.

Introduction

Maize futures contract is a deliverable contract. India is one of the largest producers of Maize in the world. Maize is the basic raw material for many Industries i.e. food processing Industry, cattle feed, poultry, Starch, alcoholic beverages and bio-fuel etc. Maize is an international commodity. Further, there has been an increase in its production over the past 15 years. Though, India is one of the top producers of maize, NCDEX maize trading activities in terms of giving or taking maize delivery through NCDEX accredited warehouse is negligible. Majority of physical trade and delivery takes place at spot market. This has made the researcher to take up maize as an interesting topic for research. Earlier research work which has already been undertaken is limited to the extent of secondary data. But, certain issues which cannot be captured and analysed with the help of secondary sources of data have to be addressed by employing primary source of data. Many research studies undertaken earlier were conceptual/theoretical aspects and on price discovery aspects through secondary data. No study has been so far attempted to consider primary source of data as well, to study trading activities to find out trading issues exist between demand and supply side of NCDEX Maize futures market. So this study is an attempt to address the above said issues which in turn benefits different market participants.

Commodity Futures

Commodity markets are classified into spot/physical/open/cash market and Derivative/futures market. Spot market is a physical market where commodities are sold and delivered for ready cash. Indian scenario of spot market for agricultural commodities has been regulated by APMC Act, which allows the state government to control the market. Large numbers of intermediaries such as commission agents, brokers and dealers etc. are associated with spot market to assemble and distribute the agricultural commodities. Price is determined through free market process, i.e. by negotiation at different stages from farmers at rural stage, wholesale and retail stage.

Risks associated with agri commodities can be avoidable, controllable, transferrable and manageable. Commodity price risk means the risks arising from plausible loss due to adverse price movement. Price risk is transferable from hedgers (risk averse) to speculators (risk seekers) through commodity futures contract. Hence, hedging price risk through futures contract is the process to control the effect of these risk exposures in order to protect from adverse price movement and to earn profit from favourable price movements. According to Prof. G. Kotreshwar "Commodity futures markets have evolved out of forward market. Futures contract is an

exchange traded version of forward contracts. Each contract has specifications prescribed by the exchange from time to time. Futures contract is a standardised contract which can be settled either through cash settlement by squaring off the positions or through final delivery of commodity through exchange approved warehouse” (G. Kotreshwar 2006).

Maize Futures Contract

There are 34 agri commodities listed and traded at NCDEX in India. Maize is one such commodity which has been traded since 2005 January. Exchange traded maize futures are ideal to manage maize price risk.

A Brief Review of Literature

Kiran Karande (2007) has explicated the commodity futures markets in India related to three aspects of futures market, i.e., basis risk, price discovery and spot price volatility with reference to castor seed futures market for four contracts at Mumbai and Ahmadabad from 1985 till 1999. This study concluded that with the introduction of castor seed futures contract at Mumbai and Ahmadabad, there is a beneficial consequence on spot market. Further, these two futures markets lead the spot market in terms of price discovery, indicating that futures markets perform the price discovery function.

Nath and Lingareddy (2008) explicated the volatility in the prices of two pulses namely urad and gram, during the period of its futures trading as well as prior to introduction and after its ban. The study covered the prices of selected commodities, volume of its futures trade which was collected from FMC and MCX websites. Collected secondary data were analysed with the help of various statistical methods percentage and percentage variations, correlation - regression analysis and Granger causality test. The results evidenced that there is a high volatility of prices of these two pulses during their futures trade. However, even this type of volatility was not found prior to the introduction and after its ban. This contributes that high price volatility persisted due to introduction of futures market, which is against the recommendation given by various committees about setting up of futures market in India.

Mohan Kumar (2008) studied the Indian maize Futures market with some specific objectives: To analyse the growth and instability of maize in terms of area and production in India, to study the behavior and price movement after the introduction of maize futures, to analyse the relation between maize spot and futures market prices, to forecast the maize and to understand the perception of maize farmers and traders about maize futures trading. Both primary and secondary source of data were collected. Thirty farmers and traders were randomly selected from APMC Davangere. Findings of this study revealed that there is a significant growth in terms of area, production and yield of maize during 1985-2005 periods. However some states experienced area wise growth in production and some states had yield led growth. Elicited response from farmers and traders exhibited that farmer, with lack of knowledge about futures trading, illiteracy, rainfed cultivation and small farm holdings, impact negatively on the prospects of their participation in futures trading activities.

Vasisth and Bhardwaj (2010) empirically analysed the extent of volatility of maize price at Nizamabad market, the extent of integration and lead-lag relationship between maize spot and futures market prices of Nizamabad. Maize crop was selected purposively as this price observed the high order of volatility. Two contract months’ (August and September 2008) data of maize spot and futures price was considered for the study. Cointegration test, Granger causality test and GARCH model were applied to empirically arrive at the result. Results show that the series are stationary at the first order of difference. There exists cointegration relationship between the series. There is a unidirectional Granger causality from futures market to spot market of maize. The study witnesses GARCH (1,1) model with persistence and asymmetry in volatility of maize future prices for August contract than that of September contract. It means August contract price series has the tendency of volatility which may persist for a longer period of time. This study tells about the existence of price discovery process in the futures market than in the spot market. Further, results observe that price fluctuation exists in the market for a long period. However, the results revealed are limited for two months contract and therefore, there is a need to study the maize futures market for a longer period.

Arora and Hada (2014) examined the fundamental factors which determine the volatility of guar gum futures prices and analysed the trend of futures and spot price of guar gum from 1 Aug 2013 to 31 Dec 2013 by arranging chart. Guar gum prices are affected by the factors such as international demand, changes in domestic production due to rainfall fluctuation, exchange rate, carryover stocks and mismatch of demand and supply and government policies. The correlation coefficient results proved that there is a positive correlation between spot and futures prices of guar gum. Volatility and its persistence were proved.

Vasantha and Mallikarjunappa (2015) empirically analysed the price discovery dynamics and lead-lag relationship between pepper spot and futures market in India with the total observations of 2,535 from 2004 to 2012. The result found that both the markets have bidirectional relationship and simultaneously play a significant role in price discovery process. Johansen's Cointegration test determines the existence of long-run relation and found that there is one cointegrating vector between the two markets. Further, VECM -EGARCH test confirmed the existence of short run causality relation and lead-lag relationship showed that spot market leads the futures market and volatility spill over found from spot to futures, indicating that there is a strong information flow from pepper spot market to futures market. This result was further supported by the result of EGARCH (1,1) model revealing that spot market plays a leading role in price discovery dynamics.

Senthil (2015) has again observed the emerging avenue for investors is commodity futures market. On this backdrop, survey was conducted to evaluate the behavior of investors and factors influencing their decision on commodity trading and their purpose and risk factors towards trading activities. Results revealed that the respondents' marginal contribution towards investment and trading activities at commodity futures. Market risk is the major threat for their investment. However, through diversified investment into commodity futures help them to manage their price risk. Finally, some suggestions that are given highlight the need for reduction in transaction cost, tax and encouragement for more awareness programme.

After an extensive literature review (only a few selected articles are mentioned above), issues realized were; Empirical studies on price discovery role of the Indian agri commodity market are few in numbers and most of the studies examine the price discovery role by using commodity indices or few commodities from the same category of commodities. However, each commodity has its own unique set of characteristics. Examining the price discovery role of Indian agri commodity market specifically at individual commodity level and including actively traded commodities from all categories may bring more insights into the inter-temporal causal relationship between commodity futures and spot prices. Further, to understand the pulp of the problem prevailing in the agri commodity futures market, there is an urgent need to interact with active market participant, which has not yet been done so far, as far as researcher's knowledge is concerned. Some studies based on primary data were conducted only in stock market trading activities. But, agri commodity futures trading and its bottleneck have to be addressed only with the interaction through field work. Therefore, the present study has identified this gap and extensively carried out the research work considering both primary and secondary sources of data for analyzing the research objectives so as to suggest some policy measures for the selected topic.

Research gap

The perceptual study of maize futures contract is based on fulfillment of functions of this market. A few studies have attempted to examine the price discovery function relating to agricultural commodities including maize by considering only secondary source of data. No study has attempted yet to examine the perceptual study of maize futures contract. Hence, this study attempts to fill this gap by considering primary source of data.

Research Design

For the purpose of collecting primary data, a structured questionnaire was administered and distributed. The primary study is based on structured questionnaire. The instrument was standardised by means of the factor analysis. The internal consistency of the research instrument was authenticated based on content validity and construct validity. The external consistency of instrument was confirmed on the basis of Cronbach's α . Various statistical tools and techniques have been applied to analyse the data. The target group responses were processed and analysed with statistical tools such as charts, tables and descriptive statistics. The hypotheses are tested using One Sample T-test, Levene's Test for equality of variances and Independent sample t test. The data collected from respondents were analyzed with the help of SPSS package 20.

Objectives of the study

Objective 1.

“To examine the perception of respondents about the factors influencing the performance of MFM in India”.

Hypotheses

H₀: “There is no significant difference in the perception amongst the respondents about the variables influencing the performance of MFM in India.”

H1: “There is a significant difference in the perception amongst the respondents about the variables influencing the performance of MFM in India.”

Objective 2.

“To examine the perception of respondents about the factors influencing price risk management”.

Hypotheses

H0: “There exists no difference in the perception of respondents about factors influencing price risk management”.

H1: “There exists a difference in the perception of respondents about factors influencing price risk management”.

Objective 3.

“To examine the difference, if any, in the perception from among the respondents about the performance of MFM in India”.

H0: “There is no difference in the extent of the performance between buyers and sellers”.

H1: “There is a difference in the extent of the performance between buyers and sellers”.

Reliability Analysis -In the study, Reliability analysis is applied to check the degree of uniformity of a scale. The internal consistency method was selected to measure the reliability of the research instrument applied in this study. It refers to the degree to which items in the set are homogeneous. Reliability coefficient such as Cronbach’s alpha (Cronbach, 1951) is used to estimate the internal consistency. Table_1exhibits the reliability co-efficient associated with the two components of the questionnaire.

Table1 : Reliability Analysis

Component	Cronbach's Alpha	No. of Variables
1	0.922	5
2	0.789	5

Source: Primary data

Table 1 represents Cronbach’s alpha value of the present study. The reliability co-efficient ranged from 0.789 to 0.922 for the component scores. Cronbach’s alpha determines the reliability based on internal consistency. Typically, variables having a co-efficient of 0.70 are considered adequate for the study (Cronbach, 1951; Nunally, 1978). Accordingly the scale used here was judged to be reliable.

Results – Analysis and Discussion

Objective 1.To examine the perception of respondents about the factors influencing the performance of MFM in India.

Hypotheses**H0:** “There is no significant difference in the perception amongst the respondents about the variables influencing the performance of MFM in India.”

H1: “There is a significant difference in the perception amongst the respondents about the variables influencing the performance of MFM in India.”

The above hypotheses are tested by using ANOVA and post hoc test and the results are as under:

Table _2 Group Statistics for respondents’ perception on the Variables

	Category of respondents	N	Mean	Std. Deviation	Std. Error Mean
Internal Variables	Buyers	140	3.7086	.76596	.06474
	Sellers	60	3.8833	.37424	.04831
	Facilitators	37	3.9568	.30234	.04970
	Total	237	3.7916	.63641	.04134

External Variables	Buyers	140	4.5107	.50968	.04308
	Sellers	60	4.2333	.22953	.02963
	Facilitators	37	4.2342	.22977	.03777
	Total	237	4.3973	.43916	.02853

Source: Primary data

Table_2 displays the descriptive statistics of One Way ANOVA for internal and external variables' score in terms of categories. These categories of respondents are the major players in the market. They are buyers, sellers and facilitators. The total number of buyers, sellers and facilitators are 140, 60 and 37 respectively. The average score of internal variables of facilitators is 3.9568 with standard deviation of 0.30234 and it is higher than the seller's average score of 3.8833 with standard deviation of 0.37424 and buyer's average score of 3.7086 with standard deviation of 0.76596.

Table_3 Test of Homogeneity of Variances of Factor Score

	Levene Statistic	df1	df2	Sig.
Internal Factor	8.147	2	234	.000
External Factor	38.290	2	234	.000

Table_3 displays the test of homogeneity of variance of factor score to conduct ANOVA. The F value of internal factor and external factor is 8.147 and 38.290 respectively with 2 & 234 degree of freedom. Both F values are statistically significant at 5% since the p value is 0.00. Therefore the hypothesis of equal variance can be rejected.

Table4: One way ANOVA for Factor Score of Internal and External Variables among the respondents

		Sum of Squares	df	Mean Square	F	Sig.
Internal Variables	Between Groups	2.479	2	1.240	3.116	.046
	Within Groups	93.104	234	.398		
	Total	95.583	236			
External Variables	Between Groups	4.398	2	2.199	12.514	.000
	Within Groups	41.118	234	.176		
	Total	45.516	236			

Source: Primary data

As shown in the Table _4, the F value and P value of internal and external variables is 3.116 and 12.514 with 0.046 and 0.000 ($P < 0.05$) respectively. F values for both variables are statistically significant at 5% level of significance as the p value for internal variable is 0.046 and an external variable is 0.00. The null hypothesis is rejected and alternative hypothesis is accepted saying that there is a significant difference in the opinion of respondents with respect to their perception towards variables influencing the performance of maize futures market in India.

Table 5: Multiple Comparisons Factor score about perception towards the statement about influencing variables among the respondents

Dependent Variable		(I) category	(J) category	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Internal Variables	Tamhane Test	Buyers	Sellers	-.17476	.08078	.092	-.3693	.0198
			Facilitators	-.24819*	.08162	.008	-.4453	-.0511
		Sellers	Buyers	.17476	.08078	.092	-.0198	.3693
			Facilitators	-.07342	.06932	.646	-.2421	.0953
		Facilitators	Buyers	.24819*	.08162	.008	.0511	.4453
			Sellers	.07342	.06932	.646	-.0953	.2421
	Dunnett T3 Test	Buyers	Sellers	-.17476	.08078	.092	-.3693	.0197
			Facilitators	-.24819*	.08162	.008	-.4452	-.0512
		Sellers	Buyers	.17476	.08078	.092	-.0197	.3693
			Facilitators	-.07342	.06932	.643	-.2420	.0952
		Facilitators	Buyers	.24819*	.08162	.008	.0512	.4452
			Sellers	.07342	.06932	.643	-.0952	.2420
External Variables	Tamhane Test	Buyers	Sellers	.27738*	.05228	.000	.1515	.4033
			Facilitators	.27648*	.05729	.000	.1379	.4150
		Sellers	Buyers	-.27738*	.05228	.000	-.4033	-.1515
			Facilitators	-.00090	.04801	1.000	-.1181	.1163
		Facilitators	Buyers	-.27648*	.05729	.000	-.4150	-.1379
			Sellers	.00090	.04801	1.000	-.1163	.1181
	Dunnett T3 Test	Buyers	Sellers	.27738*	.05228	.000	.1515	.4033
			Facilitators	.27648*	.05729	.000	.1380	.4150
		Sellers	Buyers	-.27738*	.05228	.000	-.4033	-.1515
			Facilitators	-.00090	.04801	1.000	-.1180	.1162
		Facilitators	Buyers	-.27648*	.05729	.000	-.4150	-.1380
			Sellers	.00090	.04801	1.000	-.1162	.1180

*. The mean difference is significant at the 0.05 level.

Source: Primary data

The above table_5 shows the perceptual difference in the opinion of three categories of respondents with respect to the variables influencing the performance of MFM in India. The test results support that there is a significant difference between the perceptions of buyers and facilitators about internal variables ($0.008 < 0.05$). In the same way, there is a significant difference between the perceptions of buyers and seller, buyers and facilitators (0.000 and 0.000 respectively < 0.05); difference between the perceptions of sellers and buyers, facilitators and buyers (0.000 and 0.000 respectively < 0.05) about the external variables.

After analyzing the results of ANOVA and Tamhane and Dunnett T3 test results, the decision is to reject the null hypothesis: "There is no significant difference in the extent of the opinion between buyers, sellers and facilitators about variables influencing the performance of MFM" and to accept the alternative hypothesis: "There is a significant difference in the extent of the opinion between buyers, sellers and facilitators about variables influencing the performance of MFM".

Therefore it is inferred that the level of perception of buyers, sellers and facilitators differ significantly to ascertain the variables influencing the performance of maize futures market at NCDEX in India. Finally to summarise, all the three categories of respondents have agreed that internal and external variables influence the performance on maize futures market. However, the level of perception of buyers, sellers and facilitators differ significantly for both internal and external variables. Therefore, there is a perceptual gap which is found through this analysis and interpretation.

Objective 2

To examine the perception of respondents about the factors influencing price risk management.

Hypotheses

H0: “There exists no difference in the perception of respondents about factors influencing price risk management”.

H1: “There exists a difference in the perception of respondents about factors influencing price risk management”.

The above hypotheses are tested using Group statistics and Leven’s Independent Sample t –test and the results are as under:

Table 6: Group Statistics for respondents’ perception on the factors contributing price risk management

	Category	N	Mean	Std. Deviation	Std. Error Mean
Factor 1 (Warehouse)	Buyers	140	3.4471	.69183	.05847
	Sellers	60	3.7733	.53007	.06843
Factor 2 (Operational procedure)	Buyers	140	3.1321	.88220	.07456
	Sellers	60	3.3458	.72645	.09378
Factor 3 (Clearing house/bank)	Buyers	140	3.5262	.76187	.06439
	Sellers	60	3.5000	.62436	.08061
Factor 4 (Risk management)	Buyers	140	3.3420	.49539	.04187
	Sellers	60	3.4542	.53330	.06885

Source: Primary data

Table _6 displays the descriptive statistics of independent t test for all four factors score in terms of categories of the respondents. The categories are the major players in the market. They are buyers and sellers. The total number of buyers and sellers are 140 and 60 respectively. The average score of sellers towards accredited warehouses is 3.7733 with standard deviation of 0.53007 and it is higher than the buyers average score of 3.4471 with standard deviation of 0.69183. The average score of sellers towards operational procedure is 3.3458 with standard deviation of 0.72645 and it is higher than the buyers’ average score of 3.1321 with standard deviation of 0.88220. The average score of buyers towards clearing house/bank is 3.5262 with standard deviation of 0.76187 and it is higher than the sellers’ average score of 3.5000 with standard deviation of 0.62436. The average score of sellers towards risk management is 3.4542 with standard deviation of .49539. This indicates that these four factors and its contribution as perceived by the sellers are slightly higher than those of buyers.

Table _7: Independent Samples Test for respondents' perception about the factors contributing price risk management

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Factor 1	Equal variances assumed	.955	.330	-3.263	198	.001	-.32619	.09997	-.52333	-.12905
	Equal variances not assumed			-3.624	144.013	.000	-.32619	.09001	-.50410	-.14828
Factor 2	Equal variances assumed	2.390	.124	-1.651	198	.100	-.21369	.12943	-.46893	.04155
	Equal variances not assumed			-1.784	134.366	.077	-.21369	.11981	-.45065	.02327
Factor 3	Equal variances assumed	.122	.727	.235	198	.815	.02619	.11166	-.19400	.24638
	Equal variances not assumed			.254	134.992	.800	.02619	.10317	-.17784	.23022
Factor 4	Equal variances assumed	.000	.984	-1.434	198	.153	-.11220	.07823	-.26647	.04207
	Equal variances not assumed			-1.392	104.633	.167	-.11220	.08058	-.27198	.04758

Source: Primary data

Table _7 displays the output of t test of independent sample mean. The F value of 0.955, 2.390, 0.122 and 0.00 is statistically insignificant at 5 % since the p values are more than 5%. Therefore the hypothesis of equal variance cannot be rejected. The absolute t value of accredited warehouse is 3.263 with 198 degrees of freedom is statistically significant at 5% since the p value is 0.000. Whereas the other factors' absolute t with p values are statistically insignificant. Therefore it is inferred that the average score of accredited ware house is statistically significant and there is a difference between the perception of buyers and sellers. Except the factor 'warehouse', there is no difference between the perception of buyers and sellers on the other factors contributing price risk management.

Objective 3.

“To examine the difference, if any, in the perception from among the respondents about the performance of MFM in India”.

The following null and alternative hypotheses are formulated:

H0: “There is no difference in the extent of the performance between buyers and sellers”.

H1: “There is a difference in the extent of the performance between buyers and sellers”.

To study and analyse the above hypotheses, one way ANOVA technique is used to make the comparison between buyers and sellers on various factors to prove or disprove the performance gap.

Table 8. Group Statistics for respondents' perception on the factor contributing performance gap

	N	Mean	Std. Deviation	Std. Error
Factor 1	200	3.5450	.66338	.04691
Factor 2	200	3.1963	.84245	.05957
Factor 3	200	3.5183	.72191	.05105
Factor 4	200	3.3756	.50833	.03594
Total	800	3.4088	.70694	.02499

Source: Primary data

Table_8 displays the descriptive statistics of one way ANOVA for four factors score of respondents. The total number of observations for all four factors is 200.

Table 9. Test of Homogeneity of Variances of Factor

Levene Statistic	df1	df2	Sig.
10.453	3	796	.000

Source: Primary data

Table_9 displays the test of homogeneity of variance of factor score to conduct ANOVA. The F value is 10.453 respectively with 3 and 796 degree of freedom. The F value is statistically significant at 5% since the p value is 0.00. Therefore, the hypothesis of equal variance can be rejected.

Table 10 . One way ANOVA for factor scores of respondents' perceptions on the factors contributing performance gap

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	15.365	3	5.122	10.619	.000
Within Groups	383.942	796	.482		
Total	399.307	799			

Source: Primary data

Table_10 displays the ANOVA for factor score. The F value is 10.619 with 3 and 796 degree of freedom. F value is statistically significant at 5% since the p value is 0.00. Null hypothesis "There is no difference in the extent of the performance between buyers and sellers" is rejected and alternative hypothesis "There is a difference in the extent of the performance between buyers and sellers" is accepted. Therefore, it is inferred from the perceptual study that there exists a performance gap.

Table 11 : Multiple Comparisons Factor Score of respondents' perception on the factors contributing performance gap

	(I) factor	(J) factor	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tamhane	Factor 1	Factor 2	.34875*	.07582	.000	.1482	.5493
		Factor 3	.02667	.06933	.999	-.1567	.2100
		Factor 4	.16937*	.05910	.026	.0131	.3257
	Factor 2	Factor 1	-.34875*	.07582	.000	-.5493	-.1482
		Factor 3	-.32208*	.07845	.000	-.5295	-.1146
		Factor 4	-.17937	.06957	.061	-.3635	.0048
	Factor 3	Factor 1	-.02667	.06933	.999	-.2100	.1567
		Factor 2	.32208*	.07845	.000	.1146	.5295
		Factor 4	.14271	.06243	.130	-.0225	.3079
	Factor 4	Factor 1	-.16937*	.05910	.026	-.3257	-.0131
		Factor 2	.17937	.06957	.061	-.0048	.3635
		Factor 3	-.14271	.06243	.130	-.3079	.0225
Dunnnett T3	Factor 1	Factor 2	.34875*	.07582	.000	.1483	.5492
		Factor 3	.02667	.06933	.999	-.1566	.2099
		Factor 4	.16937*	.05910	.026	.0131	.3257
	Factor 2	Factor 1	-.34875*	.07582	.000	-.5492	-.1483
		Factor 3	-.32208*	.07845	.000	-.5295	-.1147
		Factor 4	-.17937	.06957	.060	-.3635	.0047
	Factor 3	Factor 1	-.02667	.06933	.999	-.2099	.1566
		Factor 2	.32208*	.07845	.000	.1147	.5295
		Factor 4	.14271	.06243	.129	-.0224	.3078
	Factor 4	Factor 1	-.16937*	.05910	.026	-.3257	-.0131
		Factor 2	.17937	.06957	.060	-.0047	.3635
		Factor 3	-.14271	.06243	.129	-.3078	.0224

*The mean difference is significant at the 0.05 level.

Source: Primary data

Table_11 displays the multiple comparisons of factors score. Since the level of perception of buyer and sellers differ significantly for all four factors, the multiple comparison test is conducted to analyse the perceptual difference.

As per Tamhane and Dunnnett T3 test results, in terms of factor 1 'accredited warehouse', the level of perception differs significantly from operational procedure and risk management (f- 2 and f - 4 respectively) as the p value is less than 5%.

In terms of factor 2 'operational procedure', the level of perception differs significantly from accredited warehouses and clearing house/bank (f - 1 and f- 3 respectively) as the p value is less than 5%.

In terms of factor 3 'clearing house/bank', the level of perception differs significantly from operational procedure (f-2) as the p value is less than 5%.

In terms of factor 4 'risk management', the level of perception differs significantly from accredited warehouses (f -1) as the p value is less than 5%.

After analyzing the results of ANOVA and Tamhane and Dunnett T3 test results, the decision is to reject the null hypothesis that there is no difference in the extent of the performance between buyers and sellers and to accept the alternative hypothesis that there is a difference in the extent of the performance between buyers and sellers. Finally, there is a performance gap in terms of respondents' perception. Due to this perceptual difference and gap, MFM in India is still facing the problem of less number of participant and liquidity issue. Therefore, it is referred that MFM in India is still in the process of evolution in order to consider it as an efficient market.

Suggestions

The purpose of the study has been an indepth analysis of perceptual study of Maize futures contract using primary data. Further, from this findings of the study reveal that the performance of MFM is not satisfactory. This is further reinforced by lateral findings based on interaction with the different stakeholder groups. Based on this, following suggestions are offered to improve the performance of MFM.

1. There is a need to create greater level of awareness amongst the stakeholders. Therefore, Product manager should arrange for 'meet of Investors & Farmers'. Thereby efforts should be made to involve more stake holders to participate in the market. More food processing industries should also be involved. For this, there is a need to take necessary measures. More emphasis should be given towards involvement of farmers. Moreover, there is a need to have training programme about how to use technology, investment decision based on time and tax aspects etc. Finally, overall image or spectrum of commodity exchange; Exchange has to address this issue by way of awareness campaigns and training programmes.
2. Contract specifications such as lot size for a contract, margin money and other requirements should be favourable to participants so as to increase their numbers. One of the reasons for such low level of participation is the terms and conditions of the maize contract specifications. Therefore, the concerned authorities at commodity exchange need to look into the contract specifications to redesign the contract. Contract specification related issues need to be addressed. Issues in terms of regulatory or legal aspects need to be revived and updated.
3. There is a greater need to add capacity by creating more futures market maize delivery centers. At present, there are seven delivery centers throughout India which is not adequate. For a country like India, where maize is the majorly grown, futures market has to be developed. For example, Maize is majorly grown in North Karnataka like Ranebennur, Haveri, Gulbarga and so on. Futures market delivery centers need to be opened in this region. Davangere delivery center is located far away from North Karnataka. Maize growers and traders belong to North Karnataka find it inconvenient due to distance and transportation cost.
4. Contract needs to be divided as compulsory deliverable contracts and non-deliverable contracts. Though the contract specification is designed for compulsory delivery, not even 1% of total maize production is traded and delivered through maize futures delivery centers (as discussed in the analysis part). As a result, majority of maize contract holders square off their position. They do not take maize delivery. This situation has an adverse effect on the genuine hedgers who hedged their price risk to take maize delivery. Therefore, Contract needs to be divided as compulsory deliverable contracts and non-deliverable contracts.

Conclusion

The purpose of the study has been an indepth analysis of perceptual study of MFM using primary data. Hence, it needs to be empowered by initiating the measures mentioned in the suggestions part above. An efficient MFM is essential for enabling the participants particularly hedgers to get remunerative price for their produce and bringing in desired stability in maize production and marketing. This brings a considerable number of participants to the MFM in order to accomplish the functions of price discovery and price risk management.

SELECT BIBLIOGRAPHY

Garbade and Silber (1983) “Price movements and price discovery in futures and cash markets”, *The review of Economics and Statistics*, Vol., No.2, pp.289-297.

Lingareddy, T. (2008). Expert Committee on Commodity Futures: Agreements and Disagreements. *Economic and Political Weekly*, 35-42.

Mohan Kumar (2008), Efficiency of Maize Futures, M.Sc Agri. Project, UAS.

Naik, Gopal., and Jain, Sudhir Kumar. (2002) “Indian Agricultural Futures Markets: A Performance Survey”, *Economic and Political Weekly*, Vol. 37, No.30, pp. 3616-3173.

Pindyck, R. S. (2001). The dynamics of commodity spot and futures markets: a primer. *The energy journal*, 1-29.

Pavaskar, M. (2005). Death Trap for Commodity Futures. *Economic and Political Weekly*, 14-19.

Sporleder, T. L. (1989). Pricing efficiency in agricultural markets: Discussion. *Western Journal of Agricultural Economics*, 14(1), 122-125.

Sabnavis, M., & Jain, S. (2007). Working of commodity futures markets. *Economic and Political Weekly*, 1641-1643.

Sehgal, S., Rajput, N., & Dua, R. K. (2012). Price discovery in Indian agricultural commodity markets. *International Journal of Accounting and Financial Reporting*, 2(2), 34.

Sendhil R, Amit Kar V C and Girish JK Jain(2013) “Profit and Growth of Agricultural commodity Futures In India”, Report, pp.1-12.

Sehgal, Sanjay., Rajput, Namita and Deisting, Florent (2013), “Price discovery and volatility spillover: evidence from Indian commodity markets” *The International Journal of Business and Finance Research*, Vol. 7, pp. 57- 75.

Tolley, G. S., & Farmer, B. M. (1964). Factor Market Efficiency for Agriculture. *The American Economic Review*, 54(3), 107-119.

Thomas, S., & Karande, K. (2001, July). Price discovery across multiple spot and futures markets. In *IGIDR Finance Seminar Series*.

Vasantha, G., and Mallikarjunappa, T. (2015), “Lead-Lag Relationship and Price Discovery in Indian Commodity Derivatives and Spot Market: An Example of Pepper, *The IUP Journal of Applied Finance*, Vol.21, No.1, pp. 71- 84.

Vasisht A.K., Bhardwaj S.P. (2010), “An Analysis of Volatility of Agricultural prices-A case study of Maize”, *Indian Commodity Market: Derivatives and Risk Management*, vol. p 175-187.

Wang, H. H., & Ke, B. (2005). Efficiency tests of agricultural commodity futures markets in China. *Australian Journal of Agricultural and Resource Economics*, 49(2), 125-141.

Yang, J., & Leatham, D. J. (1999). Price discovery in wheat futures markets. *Journal of Agricultural and Applied Economics*, 31(2), 359-370.

Zheng, S., Xu, P., Foster, K., & Wang, Z. (2012). Price discovery in the Chinese soybean futures market: New evidence about non-GMO soybean trading. *Journal of Chinese Economics*, 1(1).

List of Books

1. Risk Management– Dr.G. Kotreshwar, Himalaya Publishing House.
2. Futures, Options And Swaps – Robert.W.Kolb, JamesA.Overdahl , Blackwell Publication.
3. Options and Futures- D.C .PatwariAnshulBhargava, JAICO Publication, Mumbai.
4. Indian Commodity Markets- Velmurugan .P.S, P. Palanichamy, V. Shunmugam, Serials Publication, New Delhi.
5. Derivatives – T V Somanathan, Tata MCG raw Hill Education Private Limited.
6. Essence of Educational Research Methodology, vol.2 – Dr. Basavaiah, Neelkamal Publications, New Delhi.

