

Price Discovery Function under a Conditional Random-End (RE) Trading Mechanism



ISBN: 978-1-943295-14-2

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In a conditional RE trading mechanism, the orders are used to project an opening or closing price on a real-time basis over a certain time interval (e.g., five or ten minutes) before the normal opening or closing time. Using the real-time order book, it analyze all RE occurrences on the agricultural commodity market in India. A significant part of this price stabilization effect came from the cancellation or correction of existing orders. The objective of this paper RE to examine economic roles and significance of in price discovery function in selected agricultural commodity market of India

Keywords: Conditional Random-End (RE), Trading Mechanism, Price stabilization, Price *Discovery*

Objective: The objective of this paper RE to examine economic roles and significance of in price discovery function in selected agricultural commodity market of India

1. Background Note

Opening and closing prices of individual agricultural commodity stocks in a traditional limit-order book stock exchange are typically determined by all auctions in which the exchange accumulates orders that are held but not executed until the open or close. These call auctions for individual stocks have generally evolved to include a random –end (RE) trading mechanism namely a randomization of the opening or closing time. In a conditional RE trading mechanism, the orders are used to project an opening or closing time. The projected price at the normally scheduled opening or closing or closing time is called the potential price. The extreme projected price is the projected price with the largest absolute difference from the potential price. The absolute difference between the extreme projected price and the potential price is called the extreme distance. If the extreme distance exceeds a threshold (percentage of the potential price) , the RE trading mechanism is invoked and the call auction extends for a brief randomly chosen span of time called RE session otherwise the market opens or closes at the normally scheduled time. Opening and closing prices of individual stocks in a traditional limit-order book stock exchange are typically determined by call auctions, in which the exchange accumulates orders that are held but not executed until the open or close. These call auctions for individual stocks have generally evolved to include a random-end (RE) trading mechanism, namely a randomization of the opening or closing time. In a conditional RE trading mechanism, the orders are used to project an opening or closing price on a real-time basis over a certain time interval (e.g., five or ten minutes) before the normal opening or closing time. To effects of a conditional random-end (RE) trading mechanism on price discovery, efficiency.

Using the real-time order book, it analyze all RE occurrences on the agricultural commodity market in India. A significant part of this price stabilization effect came from the cancellation or correction of existing orders. The extreme projected price is the projected price with the largest absolute difference from the potential price; the absolute difference between the extreme projected price and the potential price is called the extreme distance. If the extreme distance exceeds a threshold (expressed as a percentage of the potential price), the RE trading mechanism is invoked and the call auction extends for a brief randomly-chosen span of time (hereafter the “RE session”); otherwise, the market opens or closes at the normally scheduled time. If the threshold is zero, then the RE trading mechanism is invoked for all listed stocks at the normal opening or closing time, i.e., the RE trading mechanism is unconditional The random length of the extension is not announced until the extension ends. In the remainder of this paper, “RE trading mechanism” means a conditional RE trading mechanism, unless otherwise specified. The world’s major exchanges have adopted RE trading mechanisms “in order to reduce price manipulation” (e.g., rapid price fluctuations by manipulative orders such as spoofing orders) during periodic call auctions. More specifically, the randomization is primarily designed to enhance the market integrity by forcing traders to withdraw orders that were not intended to be executed, but instead intended solely to manipulate the price. In addition, on the expiration dates of derivative contracts whose prices are closely linked to the prices of underlying stocks, the threshold for invoking the RE trading mechanism is drastically reduced to prevent a possible surge of manipulation. The resulting price stabilization is intended to enhance price discovery and efficiency during the opening and closing call auctions. In this paper, try to examine whether the exchanges [conditional] RE trading mechanism is effective in accomplishing these objectives, and discuss the appropriate design of RE mechanisms more generally.

2. Gap in Research Literature Review

Numerous studies on price discovery have been conducted, on trading activity affects price discovery in a conditional random-end (RE) trading mechanism.

Brindha, & Suseelamani (2016) **this** paper examines the effect of price discovery mechanism for commodity futures market thereby it estimates the relationship between futures and spot prices. GOLD and SILVER are two commodities considered for evaluation. The result states that futures prices have found less volatility than spot expected price. The futures market has two important economic functions, i.e., hedging and price discovery. Price discovery refers to the use of futures prices for pricing cash market transactions. The price discovery function depends on whether new information is reflected first on futures or spot prices.

Joshy. K.J & Ganesh L (2015) the study aims at analyzing the price discovery process of gold in Indian commodity market. It also examines the long run dynamic relationship between spot and futures markets and looks into the volatility impact of futures price on spot price as well as the volatility impact of spot price on futures price. In order to test the hypotheses different econometric tools are employed. The Johansen co-integration reveals the dynamic relationship between spot and futures markets. The results of VECM indicate that the spot market is dominant in the price discovery process.

Gumeet Singh (2015) This paper investigates the price discovery function of futures market for two non precious metals - nickel and zinc on Multi-Commodity Exchange (MCX) using Johansen's co-integration test, VECM and Granger causality test. The analysis used daily data on spot prices and near month futures prices of two non-precious metals over the period. The results of VECM show that there is a bi-directional causality in spot and futures market but the futures market is found to be more sound in terms of discounting new information than the spot market.

Leo H. Chan & Donald Lien (2014). In this paper examine how cash settlement affects the ability of the futures market to predict future spot prices. Adopting the Geweke feedback measure, we find that the feeder cattle futures contract improves its price discovery function after the cash settlement was adopted in August 1986. Moreover, spot and futures markets become more integrated thereafter. After cash settlement was adopted, the futures market is less effective in price discovery.

Sehgal, Ahmad and Deisting (2014) have not examined the nonlinear causal relationship between the futures and spot markets. Price discovery occurs in the futures markets because the futures market reflects new information more quickly than the spot market due to lower transaction costs and greater flexibility. The trace test and maximal Eigen value test reveal that agricultural commodity futures prices have a long term (co integrating) relationship. However, could not observe any short term causal relationship even among the related agricultural commodities.

Kushankur Dey, Debasish Maitra, (2012). A study on the price discovery function of Agricultural Commodities in Indian markets found that there is an efficient price discovery process in place. It also recommended the strengthening of the market regulatory framework. An emphasis on the autonomy of Forwards Market Commission was made. The study also revealed about the need for well developed warehousing and market linkages.

Sanjay Sehgal, Namita Rajput, Rajeev Kumar Dua, (2012). So far as the long-term relationship between Futures and Spot Prices for the Agricultural Commodities is concerned, a study on agricultural commodities like Maize, Chickpea, Black Lentil, Pepper, Castor Seed, Soybean and Sugar was conducted and found co-integration in their Futures and Spot prices. There was also a short-term relationship between them and the Futures markets had ability to predict spot prices for Chickpea, Castor Seed, Soybean and Sugar. It was also found that there was a bi-directional relationship in the short run among the Maize, Black Lentil and Pepper

Jabir Ali, Kriti Bardhan Gupta, (2011). So far as the efficiency of Indian commodity market in terms of price formation of agricultural commodities traded on commodity exchanges is concerned, one study by applying co- integration analysis and GARCH model on agricultural commodities, confirmed that the co- integration between commodity futures and commodity spot market indices present. It further emphasized that with the information of any one index, hedging can be done on other commodity indices. It also found new information as an important factor to predict the future value of commodities

Ranjit and Asima, (2010).A study on price discovery and volatility has clearly suggested that futures trading in agricultural goods and especially in food items have neither resulted in price discovery nor less of volatility in food prices. Further, it is observed a steep increase in spot prices for major food items along with a granger causal link from futures to spot prices for commodities on which futures are traded.

Sen and Paul, (2010). Ghosh (2010) has tested the efficiency of wheat futures market by determining whether future price of wheat can be used as reference and the impact of volatility of future prices on physical markets. Narela Mandi at Delhi which has highest trading volume in Delhi and its prices are considered as indicative prices in India was studied for spot market prices and Vector Auto regression and Granger causality tests were conducted. Results gave little evidence to suggest that futures price serves as reference price for transacting contracts in the physical market, and therefore futures market volatility cannot lead to volatility in the physical market. Informational efficiency of futures market stabilizes the spot market.

3. Research Methods

Data Source: Present research the secondary data will be used from the different official sources.

Time Frame: - The time frame chosen of the study from Jan 2018 to Nov 2019

Model and Test Specifications: - Descriptive statistics will be employed

Coverage Area of Research: - NSDEX Official website.

Sampling Frame: -The stock of BSE and NSE

Sample Size: 430 trading days

Sample Procedure: - Stratified random sampling procedure will be used for this research.

RE Occurrence: RE occurrences at the opening and closing call auctions

Table No 1 Descriptive Statistics on RE Occurrence

Panel A :- Number of sample stock										
			Total sample stock							
			Opening Closing		Opening Closing		Total (RT)			
N Number of sample stocks (A) 1473					822		651			

Number of RE Stocks (B) 1412			1333 284		769 752		798		564 532 614	
RE Occurrence Ratio (B/A) 95.6%			90.5% 87.2%		93.6% 91.5%		97.10%		91.9% 81.7% 94.30%	
Max 106			69 52		69 52		106		41 21 48	
min 1			1 1		1 1		1		1 1	
Average 14.26			11.08 4.97		16.14 8.87		22.12		6.87 3.04 8.87	
median 11			9 3		16 14		6		6 2 6	
Panel C: Number of RE occurrence and RE occurrence ratio										
Number of RE Occurrences 22248			15996 6462		12460 5153		17613		3536 1309 4845	

From the above analysis and results shows that all RE occurrences among 1473 stocks listed on BSE and NSE stock exchanges the two equity market within the during the daily opening and closing call auctions for two years for 430 trading days from Jan 2018 to Nov 2019 . This is the appropriate period to test the BSE- NSE {conditional} RE trading mechanism a rare in experiment in Indian stock exchange market. The above analysis shows descriptive statistics on RE occurrences at the opening and closing call auctions were each held by BSE (9 769, 752) and NSE (564, 532) . There were 22248 RE Events, 15996 RE events at the open and 6462 at the closed.

Results : Price stabilization effect of RE trading Mechanism							
year	Year	No of unchanged price	Number of reversal of changes	No of continuations price changes	total no of RE occurrences	Price stabilization Rate B/B+C	
Panel A : Opening Price							
BSE 2018		2018	2412	2633	2012	7057	56.70%
		2019	1678	2178	1547	5403	58.50%
sub total		total (A)	4090	4811	3559	12460	57.50%
		2018	722	689	612	2023	53.00%
NSE 2018		2019	514	526	473	1513	52.70%
		subtotal (B)	1236	1215	1085	3536	52.80%
sub total							
Opening Price total (A+B)			5326	6026	4644	15996	56.50%
Panel B : Closing Price							
BSE 2018			2215	786	464	3467	62.90%
		2019	983	412	291	1686	58.60%
Sub total			3198	1198	755	5153	61.30%
NSE 2018			613	156	94	863	62.40%
		2019	302	76	68	446	52.80%
Sub total			915	232	162	1309	58.90%
Closing price total [A+B]			4113	1430	917	6462	60.90%
Total BSE NSE			9439	7456	5561	22458	57.30%

From the above table number of unchanged price includes 9439 of equal up and down in open. It is measures of reveals of price changes (B) which is calculated by using statistical methods for its significance. Panel A at opening prices shows number of unchanged price with 5326, number of reversal of changes 6026 number of continuations price changes 4644 and total number of RE occurrences 15996 with price stabilization and price discovery of 56.5%. Panel B at closing prices shows number of unchanged price with 4113, number of reversal of changes 1430 number of continuations price changes 917 and total number of RE occurrences 6462 with price stabilization and price discovery of 60.90% .Total BSE-NSE shows number of unchanged price with 94393, number of reversal of changes 7456 number of continuations price changes 5561 and total number of RE occurrences 22458 with price stabilization and price discovery of 57.30%

Results:					
The directional movement of the potential price					
when the RE trading mechanism was invoked					
stratus	directional				
	changes				
	(potential price)	No of occurrences	price changes after potential price to the opening or closing price		
			Number of		
			price	No	Price
			continuation	change	reversal
		(a)	(b)	(c)	(d)
	up	8016	2618	2502	2896
			32.70%	31.20%	36.10%
	equal up and down	18	-	--	--
	down	7962	2026	2806	3130
			25.40%	35.20%	39.30%
close	up	4136	614	2696	826
			14.80%	65.20%	20.00%
	equal up and down	9	----	-----	-----
	down	2317	303	1410	604
			13.10%	60.90%	26.10%

Results : Analysis on manipulative linked to trading					
Panel A : RE occurrence in constituent stocks and non-constituents stocks					
		No of RE Occurrences			
		Year (2018)		Year(2019)	Total
BSE Stocks	constituents	136		118	254
NSE Stocks		724		434	1158
	Non-constituents				1412
Panel B : Price stabilization effect of the RE trading mechanism at the close in BSE Stocks					
constituents stock					
Year	No of unchanged prices (A)	No of reversal of price changes (B)	No of Contaminations of price changes (C)	Total of RE occurrences (D)	stabilization rate (%) (B/B+C)#
2018	96	28	29	153	51.6
2019	38	13	8	59	53.3
Total	134	41	37	1412	59.42

In the above result shows that the 8016 times stocks price moved up and 7962 times down from the projected opening or closing price when the RE trading mechanism was invoked. It is noted that price move up or down from 5% to 10% during the 15 minutes ie 9.0 am to 9.15 am after the opening session at 9.00 am or before the closing session at 3.0 pm ie 3.15 pm to 3.30 pm. It is also further noted that price changes after the potential price to the opening or closing price which terminal the RE session. The number of occurrences at the opening upward occurrences 8016 time equal 18 and down 7962 times were experienced in the RE session. At closing price up moved 4136 times and down moved 23217 as 9 times equal up and down

From the above result shows that panel A present the numbers of RE occurrences in BSE –NSE constituents stocks in year 2018 (254) and 2019 (1158) total 1412. The panel B reports the price stabilization effect of the RE trading mechanism at the close with 51.6% with continuations of price changes and 53.3% constituent stock shows number of unchanged prices in panel B.

4. Conclusions

This paper attempt to examined the economic functions and effects of BSE – NSE RE trading mechanism by focusing on price stabilization and price discovery and efficiency. The results based on analysis of RE trading mechanism during the RE sections many times worst price manipulation in the BSE-NSE stock exchange market. It is found that RE trading mechanism promoted price stabilization but with some reservations. A significant part of this price stabilization effect came from cancellation or correction of existing orders. RE trading mechanism on the expiration dates of the options or future contracts to restrain extreme manipulative attempt linked to the trading. The RE trading mechanism improved opening price discovery, but caused overshooting at the close. Policy makers should consider tighter parameters of the RE trading mechanism on the expiration dates of derivatives contracts than on regular trading days.

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