Commodities Future Market: A Study of Tur Dal

P. Chandrika[1], P. Neeraja[2]

Abstract

Agriculture is the key sector of the Indian economy that influence overall economic growth. It helps in ascertaining the growth and stability of the Indian economy. Agriculture plays a key role in the overall socioeconomic sectors of India. Keeping in view the growth of agricultural sector, an attempt has been made to analyze the agricultural commodities futures market. This market is best used for managing risks and to help the orderly establishment of agricultural markets. Hedging the commodity price risk and Price discovery is the key activity of Futures market. Commodities prices are determined by various information that flow into the market about their fundamentals and technical. It is evident from past that future prices are determined by fundamentals (such as demand and supply, business cycles, weather conditions etc) as SEBI imposed a ban on several commodities to trade on exchanges including tur dal. Therefore, an attempt is made to study the co-relation between futures trading and fundamentals by considering the case of tur dal in Indian Agricultural Commodity Futures Market by using generalized autoregressive Conditional Heteroscedasciticity (GARCH (1, 1)).

Keywords: Commodities; Future Market; Price Discovery; SEBI; Hedging.

Trading in commodity futures has been existence in India ever since from 19th century. Researchers have identified the word forward trading in commodities in Kautilya Arthashastra. Informal trading was present in ancient times but formal trading started during the nineteenth century. Commodity market has undergone many obstacles as trading remained banned from 1966 and was reinforced only in early 2000s.India is based on agriculture economy with around 70% of the population depending on it. Indian agriculture commodity futures market is a market of asymmetric information with wide fluctuations in commodity prices, shortages and surpluses. Commodity futures trading especially in agricultural commodities always remained controversial in India.

An attempt has been made to analyze the agricultural commodities futures market. This market is best used for managing risks and to help the orderly establishment of agricultural markets. Hedging the commodity price risk and Price discovery is the key activity of Futures market. Due to the SEBI negligence to control commodity price in the futures market, this sector remains to be under-developed. According to the Essential Commodities Act of 1955, free trade is restricted in most of the commodities.

In the late 1960's, droughts forced farmers to depend on forward contracts. The abusive market practices by some of the traders have lead to increase in commodity prices which lead government to ban the trading in many commodities like jute, cotton and tur dal etc. during 007-08. Consequently, Derivatives in agricultural commodities were challenged by a major crisis. However, based on the recommendations of World Bank, United Nations Conference on Trade and Development (UNCTAD) and Kabra Committee, Government of India lifted the ban on commodity

Author's Affiliation: [1]Research Scholar, Department of Commerce, University College of Commerce & Business Management, Osmania University, Hyderabad, Telangana State, India - 500007. [2]Professor, Department of Business Management, Malla Reddy College of Engineering and Technology, Hyderabad, Telangana State, India - 500100.

Reprint's Request: P. Chandrika, Research Scholar, Department of Commerce, University College of Commerce & Business Management, Osmania University, Hyderabad, Telangana State, India - 500007.
E-mail: chandrika.palle@gmail.com

futures trading in 2003. By considering the case study of Tur dal, the pros and cons of ban in futures trading and removal of ban will be discussed in this paper.

Review of Literature

Mukherjee (2011) conducted a generalized study on the impact of futures trading on Indian agricultural market and also suggested policy measures to strengthen the market structure. Commodity markets should not be confused with stock markets as they have a different market structure with different rules and regulations.

Sharma (2009) studied the effect of the ban of futures trading on agricultural commodities with a specific study on wheat and maize to see whether trading actually caused volatility in the spot market. He also suggested policies for farmers who are unable to participate in the commodity market to trade their goods.

Srinivasan (2008) studied the impact of the price and risk on crops before and after the implementation of the ban taking four main commodities namely – potato, chickpea, soy oil and rubber all of which was banned during the same time. The report argued that banning destructs the healthy running of a market and is completely illogical as it did not at all help in curbing rise in food price.

Bekiros and Diks (2007) studied the relationship between the spot and futures price in the crude oil market using co-integration and linear causality.

Research Gap

The literature related to the effects of ban in the agriculture futures market is limited in the commodities futures market. Though agriculture futures market is growing in India, it is undergoing major crisis because of the unfair trade practices by some traders. In this context, an attempt has been made to study the reason and effect of ban on agriculture futures market by considering the case study of Tur dal.

Objective of the Study

The objective of the study is to find the reason for the reform process by SEBI for lifting ban on agriculture futures market by considering the case of tur dal.

Hypotheses of the Study

H_{01}: There is no impact of ban on Agriculture Commodity Futures Market.

Research Methodology

The daily closing futures prices of Tur Dal since its introduction is collected from NCDEX for the study. This study examines the effect of pre and post ban on tur dal in the agriculture commodity futures market by using Autoregressive-moving-average model (ARMA), and Generalized Autoregressive Conditional Heteroscedasticity (GARCH (1, 1)) model. Descriptive statistics will be applied to analyze the characteristics of the data.

Results
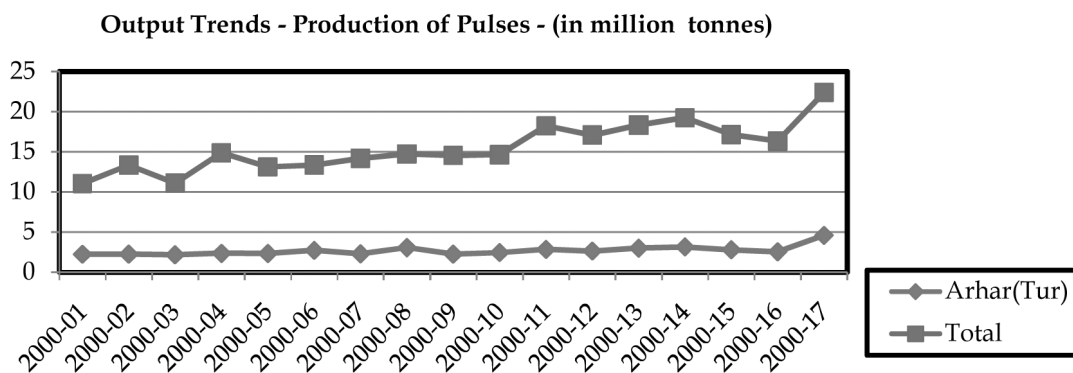
Graph 1: Trend in Production and price of tur dal from 2000-2017.
Source: Economic Outlook

Production-Price Trend in Tur Dal

The above graph 1 depicts the co-movements in the production and prices of Arhar pulse during the period from 1991 to 2012. It is the second most consumable pulse in India across regions as it is being used in many Indian dishes. Thus it achieved the status of the second most vital pulse crop having larger coverage in terms of production level after gram but the worrisome story is the production of tur has been stagnant since 1991 and ranges within a band of 22 to 26 millions tonnes except a major fall in the year 1997-98 and a major rise in the year 2007-08 i.e. 18 and 30 million tonnes respectively. Hence there is stagnancy in production level but not stability in year to year production level. Contrary to this WPI of tur shows an upward movement and fluctuated between 40to200. Thus, there has been no perceptible growth in production of Tur pulse. However, the prices moved up sharply indicating that supply could not keep pace with the demand as effect of higher MSP is low on production level.

Table 1: Descriptive Statistics

	Mean	Std. Deviation	N
Futures Price	1934.000	80.6102	2
MSP	1480.000	98.9949	2

Source: www.ncdex.com

The above table 1 represents the mean price of tur dal was Rs.1934/qtl and minimum support price is Rs1480/qtl during 2004-2006.

Table 2: Correlations

		Futures Price	MSP
Futures Price	Pearson Correlation	1	1.000**
	Sig. (2-tailed)		.
	Sum of Squares and Cross-products	6498.000	7980.000
	Covariance	6498.000	7980.000
	N	2	2
MSP	Pearson Correlation	1.000**	1
	Sig. (2-tailed)	.	
	Sum of Squares and Cross-products	7980.000	9800.000
	Covariance	7980.000	9800.000
	N	2	2

Source: www.ncdex.com

Correlation is Significant at the 0.01 level (2-tailed).

The above table 2 represents the correlation between minimum support price and futures price and the results show there is a perfect positive correlation between futures and MSP.

Augmented Dickey Fuller Test on Tur Dal Returns

Null Hypothesis: RETURN has a unit root
Exagenous: constant
Lag Length: 1 (automatic-based on SIC, maxlag=13)

		t-Statistic	Prob.*
Augmented Dickey-fuller test statictic		-9.969034	0.0000
Test critical values:	1%	-3.476143	
	5%	-2.881541	
	10%	-2.577514	

Augmented Dickey- fuller Test Equation
Dependent variable: D (RETURN)
Method: Least Squares
date: 02/07/18 time: 23:21
Sample (adjusted): 8/05/2006 1/23/2007
included observation: 144 after adjustments

Table 3: Augmented Dickey Fuller Test on Tur Dal Returns

Variable	Coefficient	Std. Error	T-Statistic	Prob.
Return (-1)	-1.098113	0.110152	-9.969034	0.0000
D (Return (-1)	0.222945	0.082234	2.711112	0.0075
C	-0.002130	0.001850	-1.151305	0.2516
R-Squared	0.476261	Mean dependent var		5.84E-05
Adjusted R-Squared	0.468832	S.D Dependent var		0.030243
S.E. of regressin	0.022042	Akaike info criterion		-4.771147
sum squared resid	0.068503	Schwarz criterion		-4.709275
Log likelihood	346.5226	Hannan-Quinn criter		-4.746006
F-Statistic	64.10906	Durbin-Watson star		1.985154
Pro (F-statistic)	0.000000			

Source: www.ncdex.com

Estimation of Return and volatility of Tur dal futures return using GARCH (1, 1) model

Dependent Variable: Return
Method: ML ARCH- Normal distribution (BFGS/ Marquardt steps)
Date: 02/07/18   Time: 23:22
Sample: 0/03/2006 1/23/2007
Included Observations: 146
Failure to improve likelihood (non-zero gradients) after 56 iterations
Coefficient covariance computed using outer Product of gradients
Presample variance: backcast (parameter= 0.7)
GARCH= C (2) + C (3)* RESID (-1) ^2+ C (4)* GARCH (-1)

Table 4: Estimation of Return and volatility of Tur dal futures return using GARCH (1, 1) model

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-0.001644	0.001212	-1.355521	0.1753
	Variance Equation			
C				
RESID (-1)^2	1.33E-05	2.79E-06	4.784291	0.0000
CARCH (-1)	-0.061236	0.007792	-7.858426	0.0000
	1.049636	0.000178	588.0758	0.0000
R-Squared	-0.000126	Mean dependent var		-0.001894
Adjusted R-Squared	-0.000126	SD. Dependent var		0.022436
S.E. of regression	0.022437	Akaike info Criterion		-4.954303
Sum squared resid	0.072997	Schwarz criterion		-4872560
Log likelihood	365.6641	Hannan- Quinn criter		-4.921089

The above table 3 shows the computation of stationarity test on the log values of future returns of tur dal. To confirm the stationarity of the series statistically, augmented version of dickey Fuller test has been employed. The null hypothesis is that the series is non – stationary and if the calculated value exceeds the critical value the null hypothesis may be rejected implying the stationary characteristics of the series. The results of the test confirm that the data series of future return is stationary (p<0.05).

The above table 4 shows the estimation of future return and volatility of futures market of tur dal using GARCH (1, 1). In mean equation, future returns are exhibiting insignificant impact of volatility. In conditional variance equation, the ARCH coefficients has significant impact on the volatility of future returns implying that there is a pronounced effect of previous shock on the current volatility of future returns of tur dal (p<0.05). The GARCH coefficient has significant impact on the volatility of future returns implying that there is a pronounced effect of volatility on the current volatility of future returns of tur dal(P<0.05).

An analysis of spot and futures prices of the tur dal shows a high degree of positive correlation between the prices. A cause and effect relationship, however, is difficult to establish. An analysis of pre ban and post ban, futures data could not indicate a clear increase or decrease in the volatility of spot prices due to futures trading. The futures trading can't be held responsible for the increase in spot prices because the evidence was, at best, ambiguous.

Most attempts to establish cause effect relationships between the futures and spot prices have been inconclusive because participation in the futures markets isn't total. Price determination in the spot market is based demand and supply, and the awareness about future markets is low. Since futures markets perform the function of price discovery, it would be inappropriate to say that futures prices have no bearing whatsoever on the spot prices. However, establishing to what extent one market is dependent on the other is far more important. Futures prices are not independent variables. Speculation has a basis. If a speculator believes that the price of a certain commodity will rise in the future, it is due to certain conditions prevailing in the economy. Speculation may magnify the rate of increase in prices, but it isn't possible for speculation alone to push prices up. Unhealthy speculation is said to be driving prices up, but when farmer participation in the future markets is low, there is essentially a disconnect between the two markets.

In January 2007, the SEBI banned futures trading in wheat, rice, *tur* and *urad* in an attempt to control inflation. The increasing inflation rates were attributed to greater price volatility due to futures trading. However, the 12 food grains included in the WPI basket only have a weight of 5.01 per cent. Of the 12 items, rice (2.449070) and wheat (1.384080) have the highest weights.

The ban has reduced the trade volumes of the future exchanges by NCDEX. However, since these four commodities only constituted 6.65 per cent of the total agriculture futures traded in 2006-07, the Abhijit Sen Committee concluded that the ban probably had an adverse effect on market sentiments, rather than directly contributing to the decline in future trade.

It was noticed that inflation rose despite the ban, and decreased later in the year when the RBI hiked interest rates. The fundamental problem with futures trading in food grains is that the huge difference between global prices and Indian prices will always reflect on and contribute to the instability in local prices.

The first and most obvious effect, and the one that led to so much opposition to the ban, was the reduction in trading volumes for commodity exchanges. Analysts suggested that about Rs.300 400 crore of business was affected on a daily basis on NCDEX and NMCE. The two largest exchanges for trading in agricultural commodities. They added that the ban would dampen investors' sentiments apart from affecting the turnover and volumes. The total trading volume for the four commodities in the three national exchanges was valued at Rs.15000 crore a month, almost 10 per cent of the total traded volume (estimated at Rs.164080 crore a month).

In March, 2017 NCDEX moved SEBI to re-launch trading in all the suspended pulses contracts: tur, urad, chana and yellow peas. pulses prices have declined in the domestic market in view of record production at over 22 million tonnes in 2016-17 crop year (July-June), making a case for lifting of ban on commodities futures.

Findings of the Study

The commodities futures market has to overcome the following challenges

The key challenge of integrating farmers on the exchange platform is

1. Limited commodities for trading.

2. Inadequate delivery centers and high cost of accessing the market are bottlenecks facing the farmers today.

3. One restriction is that we have only 25 commodities for futures trade, of which may be, 10 are active. They are not enough for farmers who are producing so many crops. We don't have all crops on futures.

4. The high cost for accessing the market. Earlier, farmers' producers' organizations were allowed to take membership on the exchange, now they are not. They have to open a client account and then approach a member. That makes it expensive.

5. There are many challenges pertaining to logistics to reach out to millions of farmers.

6. The high level of correlation between the spot and futures markets is due to the presence of arbitrageurs, who ensure that the two markets move in the same direction by exploiting any discrepancy in the prices of the two markets to their advantage. However, it isn't possible to find out the number of hedgers, speculators and arbitrageurs participating in the market.

Conclusions

Inflation has a regressive effect for both the producers and the consumers. It tends to destabilize the economy leading to a slowdown in the growth rate. India's headline inflation has reached double digits and is increasing at an unimaginable rate. It is time the government takes a measure. The SEBI in the recent past has taken quite a few steps, one of which

has been the major thrust of the study, however banning the futures market is not a logical solution. It might lead to a favorable outcome in the short run as seen in some commodities; however, to put a stop and to curtail the level of food inflation to a healthy level, the Government and SEBI needs to work alongside the Reserve Bank to tighten some of the measures stated in the previous section.

A simple analysis taking the spot prices in the banned period showed that banning future trading in the agricultural commodity market does not actually help the cause (curtailing food inflation). An efficient futures market indeed curbs price volatility and hedging future market conditions under adverse situations. The then Finance Minister P. Chidambaram had helped the futures traders by sparing them of a commodity tax which would push up the inflation rate.

The main focus of this paper was however not food inflation but how effective was the ban placed on certain commodities to curb food inflation. In this aspect, the paper has also suggested some policy measures which need to be carefully studied and implemented by the SEBI in order to help the common man from the gravity pull towards helplessness and poverty.

High price sensitivity, absorbing excessive price supply is the main reason for ban on tur dal futures trading. SEBI recently, has lifted the ban on tur dal however; it has not starting trading in the exchange. Time has to decide the future of tur dal futures trading in Indian commodity exchange.

Bibliography

1. Mukherjee K.N. Impact of Futures Trading on Indian Agricultural Commodity Market. Munich Personal RePEc Archive. 2011.

2. Sen S. and Paul M. Trading in India's Commodity Futures Market. 2010.

3. Srinivasan S. Futures Trading in Agricultural Commodity. Centre for Civil Society. 2008.

4. Bekiros SD., and Diks C.G.H. The Relationship between Crude Oil Spot and Futures Prices: Co integration, Linear and Non linear Causality. 2008.

5. www.ncdex.com.

6. www.rbi.com.

7. www.investing.com.

8. www.moneycontrol.com.

9. www.financialexpress.com.