

Executive Summary

Future Market for Agriculture Commodities in India

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The future market is an essential element of a liberalized economy. A well-functioning future market in agricultural commodities has the potential to guide farmers about their resource allocation. This guidance unlike the one based on the historical trend in prices will be forwards looking, and it will be based on the current situation and likely events in the future.

With such an expectation, the future market for many agricultural commodities was initiated in 2003; subsequently, future trade in agricultural commodities has increased. However, future trade in a commodity is suspended frequently on the apprehension of speculation. This uncertainty in the future market of a commodity restricts its emergence as an effective instrument to provide many benefits to stakeholders in the agriculture market.

The present study, therefore, analyses the future trade of agricultural commodities in historical years and assesses reasons for specific kinds of distribution of commodities in future markets. Subsequently, it analyses some of the benefits that it (future market) can provide with the cases of wheat, gram, soybean, maize kharif, and rabbi. The benefits of future trade in the above commodities are analyzed in terms of volatility, the transmission of information, and price integration in both markets (spot and future). Finally, it addresses the inflationary role of the future market in a commodity.

This has been an all-India study based on secondary information from important national (not regional) commodity exchanges of India namely Multi Commodity Exchanges (MCX), Mumbai; National Commodity Derivatives Exchanges (NCDEX), New Delhi; National Multi-commodity Exchanges (NMCE), Ahmadabad. The data from different secondary sources suggest that future trade in agricultural commodities has increased in the initial years (after 2003), but after fluctuations future trade in agricultural commodities has tapered off, and in recent years this accounts for less than 10 percent of the value of future trade in India.

The future trade in agriculture is happening primarily in NCDEX, and this is followed by MCX and NMCE. The future exchanges, other than the above three have accounted for a

minuscule proportion of future trade in agriculture. Another important feature of the future market for agricultural commodities is the low participation of farmers in future trade.

The future trade is allowed for many agricultural commodities, but in actuality, it is happening regularly for some selected commodities (guar, castor, gram, crude palm oil, soya complexes, and menthe oil) only. These commodities account for a significant proportion of future trade; for example, guar, castor oil, and soya complexes together accounted for more than one-fourth of the future trade of agricultural commodities in certain years.

An investigation into likely factors for the above pattern of future trade indicates that these commodities are not very important in the average consumer's basket. The production and distribution are highly concentrated in many of the above commodities, and the futures market provides a platform for price discovery. Some of the commodities (castor oil, guar seed, soya, and similar oil complexes, cotton, barley) traded are of the intermediate kind and have industrial use. In many commodities, the country has been an important trader (exporter or importer) in the world market. Most commodities are free from government regulation in the domestic market.

Table 1: Top Agricultural Commodities Traded at Futures Exchanges

Sl. No.	Commodity	Share in total agri. turnover of all exchanges (%)				
		2018-19	2017-18	2016-17	2015-16	2010-11
1	Guar seed	18	18.1	11.8	9.9	17.5
2	Castor seed	10.9	6.2	..	..	..
3	Soybean	9	10.3	..	..	..
4	Guargum	8	8.7	..	..	3.4
5	Chana/Gram	8	7.6	..	13.8	8.7
6	Soy Oil	..	10	16.6	12.3	23.7
7	Rapeseed/Mustardseed	..	5.7	11.8	0.6	..
8	Crude Palm Oil (CPO)	..	5.7	7.6	3.8	..
9	Cotton	..	5.6	..	..	..
10	Jeera (Cumin seed)	..	4.4	..	..	4.2
11	Mentha Oil	..	4	..	..	4.2
12	Pepper	..	0.02	..	..	5.8
	Total	53.9	86.32	47.8	40.4	67.5

Source: compiled from websites of future exchanges.

The commodities specifically studied for assessing the benefits of the future market are chana (gram), wheat, soybean, maize kharif, and maize rabi. The selection of commodities is

based on the diversity of government policies and also the availability of desired information for the commodities. The information for the above commodities is from the website of National Commodities and Derivative Exchanges (NCDEX). Their future and spot prices were extracted from the Website. The data for the present analysis consists of the daily closing (spot and future) price of a commodity, and the price is assumed to continue till a new one is declared. If multiple prices are reported within a day, the prices are averaged to generate the daily price for the analysis. The study for analytical convenience has considered the contract with the nearest maturity at each point of time. Thus, the future prices do not relate to a single contract, but it is a transit from the first contract to the latest through a series of intervening contracts. The present analysis considers data for the following periods.

Box 1: List of selected commodities and their specific period for analysis

Commodities	From	To
Chana / gram	14 July 2017	16 October 2018
Soyabean	1 January 2014	20 April 2018
Wheat	1 January 2014	12 March 2018
Maize Rabi	1 July 2013	28 March 2018
Maize Kharif	2 January 2014	20 June 2017

The commodity-specific benefits of the future market were analyzed for the volatility in future and spot markets of the commodity. Volatility is the ratio of the standard deviation of prices in both markets of a commodity. A ratio of more than one suggests that instability in the future market is higher than that of the spot market. As is apparent from the results, volatility in the future market is higher than the spot market in the gram (*chana*) only; in other commodities (soyabean, wheat, and maize) volatility in the future market is lower than the spot market. Accordingly, the ratio is less than one for the majority of commodities, and this is significantly less than one (around 0.80) in wheat, maize rabi, and kharif crops. The present findings thus refute the general impression that the future market for agricultural commodities is more volatile because of speculation kind of activities.

Table 2: Ratio of Standard Deviation of Future to Spot Price of the commodities

Name of the Commodities	Standard Deviation in Spot market prices	Standard Deviation in future market prices	R (SDFP/SDSP)
Chana (gram)	738.11	787.60	1.07
Soyabean	463.02	460.53	0.99
Wheat	146.32	119.16	0.81
Maize Rabi	148.98	125.02	0.84
Maize Kharif	173.45	143.13	0.82

Source: computed

An active future market can provide a signal for the scarcity of the commodity. The same is studied with the comparison of future and spot prices for particular dates as contango and backwardation in a commodity. Findings suggest that backwardation, that is spot price greater than future price dominates in wheat, soya, maize kharif, and rabi crops. The exception to the above is gram (chana), where it is inconclusive as the frequency of backwardation and contango are similar. The prevalent pattern suggests that demand in the spot market is higher than the supply of commodities referred (wheat, soya, and maize). However, such a conclusion may be drawn with caution. As the future market analyst suggests that frequency of future trades in the above commodities are fewer, and most of such trade in the future market happens immediately after harvest. While trade in the spot market for the above commodity is un-proportionately high, it happens throughout the year. In general price of a commodity is high during the off-season (period away from harvest) of the crop.

Table 3: Backwardation and Contango of Commodities

Name of the Commodities	Backwardation (%)	Contango (%)
Gram / chana	150 (50.2)	149 (49.8)
Soyabean	754 (71.9)	295(28.1)
Wheat	823 (82.1)	180 (17.9)
Maize Rabi	471 (63.8)	267 (36.2)
Maize Kharif	453 (86)	74 (14)

Source: computed

The efficiency in futures markets requires that variances in both markets (spot and futures) are equal, and their prices are co-integrated. The present study assesses price efficiency in future markets by ascertaining the co-integration of prices in both markets of a commodity. Since the analysis is based on historical data, the Augmented Dicky Fuller (ADF) test was performed to check the stationery of data. The study found that the price series was non-stationary at the level, but it was stationary at the first difference. The long-run relationship between future and spot prices was assessed by the Johansen co-integration test, which was based on trace statistics and eigenvalue. The estimates suggest the existence of a long-run relationship between future and spot prices of most of the referred commodities.

The direction of causation between the spot and future price was assessed with the granger casualty test. The prices are assumed efficient if the future price granger causes the spot price of a commodity. The estimates show that in gram (chana) and soya, future price granger causes spot price. Whereas, in rabi maize future price not granger causes spot price significantly. The relationship between future and spot price is bidirectional in wheat and maize kharif. The analyses thus suggest that the future market is efficient in gram, soya, wheat, and maize kharif, but it is not so in maize rabi crop.

Inspite of the above benefits, the futures markets for specific agricultural commodities are suspended frequently on the apprehension of speculative activities. The review suggests that the chances of speculation in the future trade of a commodity increase if the future multiplier is high. The future multiplier is the proportion of a commodity traded through the futures market, and this has been more than 80 percent for some commodities (pepper, mentha oil, guar gum, and guar seed). The pieces of evidence suggest that instances of speculation do not arise if the future multiplier is less (20-30 percent). Therefore speculation is more a case of chosen few commodities (pepper, guar seed) where the future multiplier has been high.

The role of the future on inflation is being carried out with the Granger causality test between trade-volumes in futures and the spot price of the commodity. The analysis shows that in maize kharif only, causality runs from volume traded to spot price; that is, future trade has a positive effect on the rise in spot prices of the commodity. Though this is not the case for other commodities (gram, soyabean, wheat, and maize rabi), and suspension of future trade (in a commodity) on the apprehension of inflation, infact introduces uncertainty in future trade of agricultural commodities.

Table 4: Grangers Causality between Future Trade and Spot Price of some Commodities

Commodity	Null Hypothesis	F Statistics	P Value
Chana / gram	Spot does not granger cause future	0.693	0.500
	Future does not granger cause spot	10.911	0.00
Soyabean	Spot does not granger cause future	0.572	0.564
	Future does not granger cause spot	66.882	0.00
Wheat	Spot does not granger cause future	14.695	0.00
	Future does not granger cause spot	4.341	0.013
Maize Rabi	Spot does not granger cause future	6.665	0.001
	Future does not granger cause spot	0.111	0.895
Maize Kharif	Spot does not granger cause future	5.400	0.005
	Future does not granger cause spot	4.727	0.009

Source: computed

The above analysis shows that the volatility of prices in the future market is less than the spot market for the majority of commodities. The prices in the spot market are greater than the future market on the majority of dates in the future market. The future and spot prices are co-integrated and future trade has not caused inflation in the spot market of commodities analyzed. The future market helps in the price discovery of the commodity, especially when the production and distribution of the commodity are highly concentrated, the commodities are traded (exporter or importer) heavily but not regulated in the country.

Considering the benefits and efficiency of the future market, it must be strengthened as an important institution for development. The strengthening requires certainty in government policies toward future trade. The above analyses also suggest that suspension of future trade on the apprehension of speculation is not right as speculation is not a general but specific case of agricultural commodities. The uncertainty in futures is not only on account of the suspension of future trade in specific commodities but also due to changes in regulations of the domestic market, for example, alteration in the future margin of the commodity. The uncertainties in future markets constrain the development of the future as a reliable and serious institution. It also affects the participation of stakeholders including farmers in the future market.

To reduce the uncertainty in future trade, it may be initially started for a limited number of commodities, which is less sensitive for an average consumer. The introduction of measures like mandatory delivery in future trade of a commodity, and participation of government parastatals (state trading enterprises) will improve the reliability and seriousness of the future market in agricultural commodities.
