A THEMATIC LITERATURE REVIEW ON STATUS OF AGRICULTURAL COMMODITY DERIVATIVE MARKETS IN INDIA

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ABSTRACT
Commodity markets assume tremendous economic importance in the wellbeing of nations and in the lives of people especially farmers. It becomes much more crucial for an agrarian nation like India, where almost 60% of the population depends on agriculture and farming for a living.. The percentage value of 60% looks even more relevant when we consider the base of 140 billion population of the country. This paper attempts to understand the commodity market infrastructure and institutional arrangements based upon the available literature. Literature related to different aspects of commodity markets such as price discovery, efficiency, risk minimization and institutional arrangement has been studied separately in a thematic manner. Different researchers have come up with varied findings and conclusions all of them have carefully studied and noted in this research paper.
Keywords: Commodity markets, institutional arrangement, marketing infrastructure, price discovery and risk minimization.

Introduction

Almost 60% of the population of India is still employed in agriculture and allied activities, making it an agrarian nation. The number 60% looks even more profound when compared with the population base of 140 billion people. Such a large farmer community with small land holdings faces challenges of uncertain rainfall, pest attacks, irrigation water scarcity, fertilizer scarcity etc. After fighting with all these problems when farmers take their produce to market, they face market challenges of price risk, buyer-agent cartel working against farmers. To overcome the market problems of price discovery and risk mitigation agricultural commodity market started in 2002 by NDA government in India but Agri-commodity derivatives have not been successful to uplift the farmers income and social status due to many problems such as low volume trade of agri-commodities, less farmers' participation and government's restriction on trade. Minimal Farmers' participation can be related to awareness, educational level and social aspects of farmers and institutional arrangement of commodity exchange. Many researchers have contributed with their research focusing primarily on above mentioned problems. Therefore, a complete review of all their research is needed to understand their findings and suggestions and also to find the research gap.

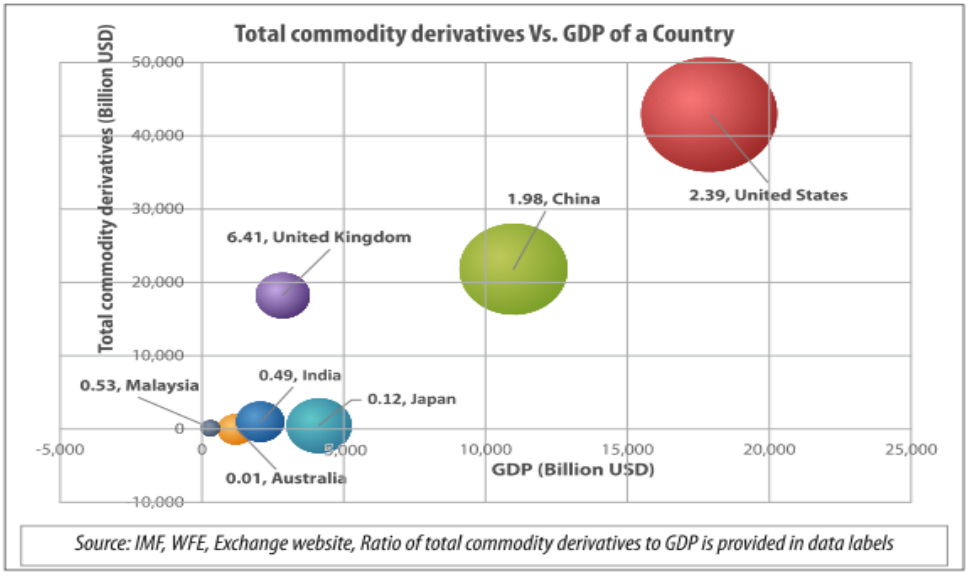

Fig.1 Ratio of total commodity derivatives to GDP of a country.

Figure 1 illustrates the potential of the commodities derivatives market by comparing the size of the market to the GDP of the nation. India's commodity market size to GDP ratio is 0.49, as against 6.41, 2.39 and 1.98 for

the United Kingdom, United States and China respectively which emphasises the Indian market for commodity derivatives' unrealized potential. Further studies suggest that share of Agri-commodity derivatives is also low in total commodity derivatives trading and farmers participation is also low.

Brief History of Commodity Markets in India

The informal forward trading is not so recent in India. References to 'futures' and 'forwards' can also be traced from Kautilya's Arthashastra (4th century BCE). In the colonial period, the British underwent rapid industrialization, textile mills flourished in Manchester, which were largely dependent for cotton on India and US colonies but in 1860 US outbroke into civil war and supply of cotton from US shrank resulting in higher demand for Indian cotton. With growing demand and trade of cotton from India, European buyers, exporters (from India) felt the necessity of market regulation and established the Bombay Cotton Trade Association Ltd. The Bombay Cotton Exchange was subsequently founded in 1893. The two exchanges facilitated spot, forward and futures trading till around 1913. During the period between the first and second civil war the commodity derivative market underwent rapid growth and expansion. However, following the Second World War, natural disasters and severe shortages hit the world economies, and as a result, most commodities' futures trading was prohibited in the middle of the 1960s.

After India adopted economic liberalisation policies in the 1990s, the government started realising the importance of futures trading in agricultural produce to make Indian agriculture more competitive at par with western countries. NDA Government under the leadership of Shri Atal Bihari Vajpayee, in 2002, reintroduced commodity futures in India and permitted establishment of national, electronic multi-commodity exchanges in India, as a consequence three national electronic multi-commodity exchanges were set up and made them operational. With a market share of almost 80%, MCX is India's biggest commodity exchange (2015-16) was established by a technology firm while NCDEX and NMCE were promoted by financial institutions like a leading private bank, an insurance major & a stock exchange, and Central Warehousing Corporation & cooperative institutions respectively.

Today, there are numerous commodity exchanges in India but apart from these small regional exchanges, Indian commodity market is dominated by six national commodity exchanges, they are Multi Commodity Exchange (MCX), National Commodity and Derivatives Exchange (NCDEX), Indian Commodity Exchange (ICEX), National Multi Commodity Exchange (NMCE), ACE Derivatives Exchange (ACE), and Universal Commodity Exchange (UCX). Both the Bombay Stock Exchange (BSE) and the National Stock Exchange (NSE)[3] began trading in commodities in 2018.

Research Methodology

The study is descriptive in nature and concentrates on commodity derivatives markets for agricultural produce. As a part of the study available literature that the researchers could access from various sources is collected and reviewed. Although institutional arrangements and the marketing infrastructure that support agricultural commodities derivatives trading have been the focus areas, literature related to other aspects such as market efficiency, price discovery, and risk management are also taken into consideration for achieving the stated objectives.

Research Objectives

1. To identify gaps in existing research on agricultural commodity derivatives in India.
2. To gain new insights about the research topic from previous studies.
3. To develop new perspectives and hypotheses based on various literature related to the topic.

Literature review related to Marketing Infrastructure and Institutions

Jairath, (2004), It is found that when compared with unregulated and wholesale markets in villages, farmers receive an average 8–10% higher price and a larger share of consumer spending when they sell their produce in regulated markets such as commodity markets. Due to differences in the distribution of regulated markets around the country and the provision of necessary infrastructural facilities in these regulated markets, the benefits that farmers receive from selling their produce in these markets vary from region to region.

Efe-Omojevwe (2013) The Efficiency of Indian Future Market for the maize and wheat crops is determined and found that the wheat and maize futures market lacked efficiency and the volatility is not always the cause of inefficiency, because even though there was no significant volatility, the market was weakly inefficient due to normal fundamentals of demand and supply. With the study of price discovery and risk considered for more participation in the future market & proper formulation of policies.

Sendhil, Kar & Jha, (2013) The study analyses the efficiency of wheat futures in terms of price transmission, price discovery and extent of volatility in terms of 3 contract periods. As a methodology, cointegration research indicates long-run equilibrium due to price transmission between the spot and futures markets. Analysis of price forecasting shows that just one contract is hedged, while prices for the other contracts are speculative. The GARCH results show that price volatility persists. The analysis mentioned above demonstrates how ineffective wheat futures are. Further it is concluded that farmer participation through institutional innovation and intervention will significantly increase its efficiency.

Takeshi, Shigeyuki (2014) examined the relationship between commodities futures' long-term equilibrium and market efficiency. The study period was from 2 January 2006 to 31 March 2011. The Johansen cointegration test was run using MCX spot prices and multi-commodity futures, which demonstrated a co-integrating relationship between them and met the criteria for market efficiency. A second test for futures market's objectivity was done using FMOLS and DOLS. The futures market for commodities is not efficient, as evidenced by the rejection of the null hypothesis, which claimed that the future price is an unbiased predictor of the current prices. As a result, it was discovered that the commodity futures market has expanded successfully since 2009, along with increasing trade volume.

Ali, Gupta (2011) studied the Efficiency in agricultural commodity futures markets in India-Evidence from cointegration and causality tests which shows that all the selected commodities, with the exception of wheat and rice, have strong cointegration in their futures and spot prices. This suggests that for most Agri-commodities, such as maize, chickpea, black lentil, pepper, castor seed, soybean, and sugar, there is a long-term relationship between futures and spot prices. According to the examination of short-term relationships by the causality test, future markets are more able to predict future prices for chickpea, castor seed, soyabean, and sugar than they are for maize, black lentil, and pepper, where there are short-term bidirectional relationships.

Parasuraman, Rao, (2014) examined the Efficiency of Commodity Markets in India. The cost-of-carry model is rejected by both single hypothesis and joint hypothesis tests, which implies that arbitrageurs should be able to take advantage of price differences between spot and futures prices in both equity and commodity markets in the absence of market efficiency to generate abnormal returns.

Kaur, Rao (2017) used the Autocorrelation test and Run test to look at the market effectiveness of four agricultural commodities: Chana, Guar seed, Refined Soya oil, and Pepper Malabar. The empirical findings of the study show that for three commodities guar seed, chana, and pepper the t-values of the autocorrelation corresponding to future and spot prices are considerably different from zero and the corresponding t value is more than 1.96. The findings support the alternative hypothesis that the commodity markets are inefficient and lead to the rejection of the null hypothesis. For the whole sample period, the non-parametric run test revealed that all selected agricultural commodities' future and spot prices are efficient in weak form.

Haq, Rao (2014) tried to investigate the efficiency in Agri-commodity futures markets of India. Cointegration test with error correction models are used to analyse long- and short-term relationships. Different data periods were taken for different kinds of commodities depending on the futures contract availability. They found that the commodity markets are not significantly efficient to help farmers to discover the prices of their commodities and also minimize market price risk.

Raghavendra, Velmurugan & Saravanan, (2016) analysed Relationship between Spot and Futures Markets of Selected Agricultural Commodities in India and focused on the relationship between spot and future prices of agricultural commodities such as Soya bean, Chana, Maize, Jeera and Turmeric for a period from January 2010 to March 2015 traded in NCDEX.

To investigate the lead-lag inter-temporal relationship between the futures and spot market prices for the chosen agricultural commodities, Johansen's Cointegration and Regression model was used. The Dickey-Fuller and Phillips-Perron tests with enhancements were used to confirm the data series' stationarity. Additionally, the Schwarz Information Criterion was used to determine the requisite data series lag length (SC). After the variables are integrated in the same order, the long-run relationships between them are examined using Johansen's Cointegration test. According to empirical findings, there may be long-term equilibrium correlations between the spot prices of the commodities and their futures. In general, there is a one-way causal relationship between future market prices and spot market prices for two agricultural commodities, namely, soy and corn.

Gupta, Choudhary & Aggarwal (2016) indicated that a large amount of the trading volume in commodities futures is being contributed by high-net-worth individuals and trading proprietors. It's interesting to note that

retail investors are now a major contributor to brokers' overall turnover. The results of the survey show that, apart from energy commodity futures, all commodity futures effectively perform the functions of price forecasting and risk hedging. The most volatile commodities, energy, are seen to be less effective at hedging than other commodities. Brokers concur that open interest, volume, and time to maturity have a high to moderate impact on the volatility of commodities futures derivatives.

Literature review related to Price Discovery and Risk Management

Agarwal, Jain & Thomas (2014) investigated the effectiveness of risk hedging and price prediction in commodity futures markets. The analysis of eight commodities, including castor seed, pepper, rubber, soy oil, wheat, crude oil, and gold, revealed that price discovery and the effectiveness of hedging in the commodity derivatives markets play a consistent role in price discovery. However, it was also discovered that due to a number of problems, including a low level of credibility for warehouse receipts, a lack of standardisation of the underlying commodities, and a mismatch between grades available and grades to be delivered, the effectiveness of hedging is lower and more variable across commodities, particularly agricultural. Along with this, the state also has extensive control over the supply of deliverable goods in the market, as well as the commodity inventory kept by traders.

Chhajed, Mehta (2013) studied average monthly spot, and future prices for nine agricultural commodities, including wheat, chana, soyabeans, oil, jute, menthe oil, rubber, potato, crude palm oil, and cardamom, traded on MCX and NCDEX between 2009–2010. Backwardation and contango were used to study the market's behaviour, while the Granger causality test utilised to test how the commodities' prices were determined. The study's findings indicate that although the price discovery mechanisms for various commodities are relatively diverse, causality can be used to forecast future and spot prices. Regarding spot and future prices, most of the commodities under the study displayed bidirectional causality. Additionally, it was discovered that backwardation and contango aid in locating market-wide hedging possibilities.

Kumar (2014) investigates the interdependence of future prices of various agro-commodities traded on NCEX, including wheat, barley, maize, gramme, mustard castor seed, soyabean, zeera, chilli, coriander, pepper, cotton seed oilcake, and sugar. This is done by examining the inter-temporal relationship between future and spot prices. Results using linear Granger causality using daily spot and future pricing data indicate that futures markets dominate spot markets for all crops, leading to spot market price fluctuations for these crops. There are two-way flows between the futures and spot markets for wheat, zeera, and barley. Because demand and supply for agricultural commodities complement each other and are linked through substitutability, the movement of futures agricultural commodity prices is interdependent. Hence, the main finding of this study is that the futures market performs the role of price discovery.

Kumar (2015) studied the effectiveness and performance of the pepper futures market in terms of its functions for risk management and price discovery. Cointegration, Granger causality, impulse response, and variance decomposition are some of the econometrics methods showed that, in terms of performance and efficiency, pepper hasn't done well. Based on the findings, it was concluded that hedgers find the futures market effective for managing price risk and that it can be very beneficial for risk mitigation tasks.

Chopra, Bessler (2005) investigated the frequency of black pepper price discovery in the spot market and long-term futures markets. From October 2001 to February 2003, black pepper futures prices and closing prices for the first month's near- and far-future contracts were available. Although data is conflicting as to whether price information is discovered in the nearby or distant contract, time series methods of cointegration and directed acyclic graphs demonstrated that price information is discovered in the future market.

Easwaran, Ramasundaram (2008) examined the role of agro-commodity future markets in price discovery. Castor, cotton, pepper, and soya are the four agricultural commodities whose prices were discovered in the study. According to the Wald chi-square test results, there was no price discovery is happening in the futures market, which meant that futures markets were ineffective in predicting future spot prices. This outcome underlined the fact that future contracts were a less-than-ideal buffer against changes in spot prices.

Nath, Lingareddy (2008) focused on the impact of future trading on spot prices in 3 commodities viz. urad, wheat and gram. The outcome of using dummy variables shows that the start of future trading in these commodities has led to increases in urad prices, but statistically speaking, the same is not true for other commodities. On the other hand, this hasn't done anything to lessen the seasonal or cyclical swings in the pricing of the chosen commodities. It was also discovered that the introduction of futures had a considerable impact on the chosen commodities' spot market volatility.

Mukherjee (2011) re-validated the effects of futures trading on India's nine most important agricultural commodities (wheat, chilli, pepper, mustard seed, castor seed, soy oil, and Mentha oil). The current analysis demonstrates that though the inflationary pressure on agricultural commodity prices has increased significantly, the futures contract's destabilising effect is sporadic in character and tends to fluctuate over an extended period of time. The empirical evidence clearly demonstrates that the futures market's competitive advantage in information dissemination results in significant price discovery and risk management, which helps to improve India's underlying commodities market.

Goswami, Mukherjee (2015) compared the risk-return on the ten agricultural commodities that are traded the most: chana, jute, kapas, pepper, wheat, rice, potato, yellow peas, sugar, and urad. The findings indicate that agricultural commodities hold a modest position in terms of risk and return. According to the general risk-return hypothesis, this article indicates that high returns are typically correlated with high risk.

Research Gap

Over the years, the commodity market has grown and performed incredibly well. Many researchers are doing several studies on various areas of the commodity market. The researcher has searched the literature but has not found any studies that provide the most recent data on the literature on the Agri-commodity market. As a result, it is necessary to give a thorough thematic analysis of the relevant literature to comprehend the studies that have been done thus far. This will allow investors to assess their investment chances and researchers to do additional research for avoiding doing the same thing twice on the other. Additionally, the present study only examines the Indian Agri-Commodity Derivative Market and compiles the pertinent literature on it because agriculture is significant to the Indian economy.

With a special emphasis on Market Efficiency, Price Discovery, and Risk Management, the current study seeks to analyse the state of India's Agri-commodity markets.

Finding and Discussion

Most of the research reviewed above were focused on efficiency of markets in price discovery of agricultural produce, their risk minimizing effectiveness and marketing infrastructure. Most of the researchers conclude that the present agriculture commodity markets are less efficient in price discovery, risk minimization and therefore the infrastructure. However, whatever the trade takes place on regulated commodity market fetch higher prices as compared to traditional markets. Therefore, it is utmost important to visit the question of institutional arrangement required for facilitating agricultural commodity derivative trade.

Some researchers argued that commodity markets have a huge potential for hedging downside risk of agricultural commodity prices but the same is not being availed by the farmers due to low level of farmers participation, inefficient price discovery in commodity markets. Some concluded that no price discovery takes place in the commodity markets. A few raised doubts on inadequate infrastructural facilities to facilitate farmers participation and agricultural commodity trade on regulated commodity markets.

References

Agarwal N. (2014). Do futures markets help in price discovery and risk management for commodities in India. Indira Gandhi Institute of Development Research(Working Paper). 3-20, Retrieved from http://www.igidr.ac.in/pdf/publication/WP-2014-020.pdf.

Ali J., Gupta K.(2011). Efficiency in agricultural commodity futures markets in India-Evidence from cointegration and causality tests. Agricultural Finance Review(Emerald Group Publishing Limited). 71(2), 162-178, DOI 10.1108/00021461111152555

Chhajed I., Mehta S. (2013).Market Behavior and Price Discovery in Indian Agriculture Commodity Market. International Journal of Scientific and Research Publications. 3(3), 1-4, retrieved from www.ijsrp.org.

Chopra,A., Bessler,D.(2005).Price Discovery in the Black Pepper Market in Kerala, India. Indian Economic Review. 40(1), 1-21, retrieved from http://www.jstor.org/stable/29793829

Efe-Omojevwe Z.(2013). A study of the Efficiencies of Maize and Wheat Futures Markets in India. IOSR Journal of Agriculture and Veterinary Science, 2(4),09-14, retrieved from www.iosrjournals.org

Easwaran R, Ramasundaram P. (2008). Whether Commodity Futures Market in Agriculture is Efficient in Price Discovery? - An Econometric Analysis. Agricultural Economics Research Review. 21, 337-344

Goswami B., Mukherjee I.(2015). Risk-Return Analysis of Different Commodity Futures in Indian Derivative Market. International Journal of Research in Finance and Marketing. 5(6), 73-78

Gupta S, Choudhary H and Aggarwal D.(2016). Efficiency of Indian Commodity Market: A Survey of Brokers' Perception. Journal of Technology Management for Growing Economics. 7(1), 55-71, DOI: 10.15415/jtmge.2016.71003

Haq I., Rao K. (2014). Efficiency of Commodity Markets: A Study of Indian Agricultural Commodities. Pacific Business Review International. 7(2). 94-99. Retrieved from www.pbr.co.in

Inoue T., Hamori, S. (2014).Market Efficiency of commodity futures in India. Applied Economic Letters. 21(8), 522- 527, DOI: 10.1080/13504851.2013.872751.

Jairath M. (2004), "Agricultural Marketing Infrastructure in India". Indian Journal of Agricultural Marketing, Conference issue 2004

Kaur G., Rao D. Efficiency of Indian Commodities Market: A Study of Agricultural Commodity Derivatives Traded on NCDEX. 1-21, retrieved from http://ssrn.com/abstract=1600687

Kumar R.,(2014).Price discovery in some agricultural commodity markets in India. Preliminary Draft. Delhi School of Economics

Kumar, V. (2015). Futures Market of Pepper in India: An Empirical Study. International Journal of Applied Research. 1(8), 580-590, retrieved from www.allresearchjournal.com

Mukherjee, K. (2011). Impact of Futures Trading on Indian Agricultural Commodity Market. MPRA. Retrieved from https://mpra.ub.uni-muenchen.de/29290/

Nath, G., Lingareddy T. (2008). Commodity Derivative Market and its Impact on Spot Market

Parasuraman N., Rao U. (2014). An Empirical Examination of the Efficiency of Commodity Markets in India. Proceedings of the Third International Conference on Global Business, Economics, Finance and Social Sciences.

Raghavendra R. (2016). Relationship between Spot and Futures Markets of Selected Agricultural Commodities in India: An Efficiency and Causation Analysis, Journal of Business and Financial Affairs. 5(1), 1-8, DOI: 10.4172/2167- 0234.1000160

Sendhil R.,(2013), Testing the Efficiencies of Indian Wheat Futures. Int. Journal of Economics and Management. 7(2), 408-430

