

COMMODITY FUTURES MARKET EFFICIENCY AND RELATED ISSUES: A REVIEW OF EXISTING LITERATURE

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ABSTRACT

The study of market efficiency in commodity futures markets is important to both the government and the producers/marketers in India. In this paper, we review the available literature on commodity futures market efficiency and related issues viz. the effect of seasonality on commodity futures market efficiency, the inflationary impact of commodity futures trading and the impact of commodity futures trading on spot market volatility. The review shows that the results produced in available literature are often conflicting: the efficiency hypothesis is supported only for certain markets and only over some periods. Also there are very few studies on microstructure and macroeconomic issues in commodity futures market, and integration with other international markets. This forms further scope of research in this area. Keywords: Commodity futures, Efficient Market, Efficiency, Volatility, Cointegration etc

Introduction

Commodity futures market is a place where farmers/producers and traders can reduce their price risk. India has long history of trade in commodity derivatives. Organized commodity derivatives in India started as early as 1875, barely about a decade after they started in Chicago. Since 2003, when commodity futures' trading was permitted, commodity futures market in India has experienced an unprecedented boom in terms of the number of modern exchanges, number of commodities allowed for derivatives trading as well as the value of futures trading in commodities. There are 22 Commodity Exchanges (6 National and 16 Regional Exchanges) recognized by FMC in India where 113 commodities are traded. Six electronic multi-commodity national exchanges recognized by the Government of India are MCX Mumbai, NCDEX

Mumbai, NMCE Ahmedabad, ICEX Mumbai, ACE Mumbai & UCX Navi Mumbai. National Multi-Commodity Exchange of India, Ahmedabad (NMCE), was the first to trade in futures from November 2002, Multi Commodity Exchange of India Ltd, Mumbai (MCX) and National Commodity and Derivatives Exchange Ltd., Mumbai (NCDEX) started trading a year later. The national exchanges accounted for 99.7% of the turnover of commodity futures contracts traded in India during FY2012-13. MCX alone had a market share of 87.3% in FY 2012-13.

Efficient Market

An efficient market is one in which prices always “fully reflect” available information and where no traders in the market can make a profit with monopolistically controlled information (Fama, 1970). In other words, an efficient commodity futures market can provide effective signals for the spot market price and eliminates the possibility that profit can be guaranteed as part of the trading process. This price reflects the equilibrium value for suppliers and demanders in the market.

Efficient futures markets provide a mechanism for managing the risk associated with the uncertainty of future events. Out of the various aspects of these markets, futures market efficiency is one of the most extensively researched topics in the empirical literature. **Sewell (2011)** critically reviews literature available on EMH. The efficient market hypothesis (EMH) asserts that financial markets are efficient. Sewell says “On the one hand, the definitional ‘fully’ is an exacting requirement, suggesting that no real market could ever be efficient, implying that the EMH is almost certainly false. On the other hand, economics is a social science, and a hypothesis that is asymptotically true puts the EMH in contention for one of the strongest hypotheses in the whole of the social sciences. Strictly speaking the EMH is false, but in spirit is profoundly true. Besides, science concerns seeking the best hypothesis, and until a flawed hypothesis is replaced by a better hypothesis, criticism is of limited value”.

Carter (1999) conducted a study on then available literature on different issues in commodity futures market. He pointed out some economic issues which should be addressed. In this research, we have focused on literature available on efficiency and related issues.

Literature Review

There are numerous empirical studies that analyze different aspects of futures markets in developed countries like the US. Out of the various aspects of these markets, futures market efficiency is one of the most extensively researched topics in the empirical literature. Most of the studies investigating the efficiency of commodity futures markets employ a conventional approach of regressing the cash price at maturity on a previous futures price. But, there are studies which used research techniques different from regression. **Samuelson (1965)** first analysed the role of futures prices as predictor of future spot prices for a given contract and found that it follows a martingale; in other words, today's futures prices are the best unbiased predictor of tomorrow's futures prices. However, **Danthine (1978) and Lucas (1978)** have both shown theoretically that periodical failure of the martingale property to hold is not evidence of the market inefficiency. **Danthine (1978)** first criticized Samuelson's (1965) argument that spot commodity prices may not follow a sub-martingale if they vary with such factors as the weather, which may be serially correlated. He went on to develop possible reasons why the link between a martingale process and efficiency in commodity markets could be problematic.

Rausser and Carter (1983) examined the efficiency of the soybean, soybean oil, and soybean meal futures markets using semi strong form test via structurally based ARIMA models. They emphasized that "unless the forecast information from the models is sufficient to provide profitable trades, then superior forecasting performance in a statistical sense has no economic significance".

Tomek (1997) stressed that if the futures market is efficient, then it should be able to out-forecast an econometric model. The development of co-integration theory by **Engle and Granger (1987)** provided a new technique for testing market efficiency. **Aulton, Ennew, and Rayner (1997), Crowder and Hamed (1993), Fortenberry and Zapata (1993), Chowdhury (1991), Mckenzie and Holt (2002)** and many others accepted and used cointegration theory for testing market efficiency.

Later, Johansen co integration technique was developed. **Wang, H. Holly et al. (2005), Bhar and Hamori (2006), Sahi and Raizada (2006), Gupta and Ravi (2013)** and many others have used Johansen cointegration to test commodity market efficiency.

However, **Neil Kellard et al. (1999)** investigated the claim whether the cointegration existence between commodity spot and lagged futures rates should be accepted as long-run market efficiency. They studied the UK wheat futures contract traded at LIFFE. They concluded that “such tests are not wholly appropriate for evaluating commodity market efficiency”.

Since the introduction of futures, there have been two way arguments about the efficiency of futures markets (both financial and commodity futures markets). So the literature has been presented separately on studies supporting efficiency and inefficiency.

Literature on Efficiency

Goss (1981) examined the unbiasedness hypothesis of futures prices of copper, tin, lead and zinc. The results showed copper and zinc futures markets as efficient. **Goss (1985)** revised his paper by introducing joint tests for the same metals of the LME extending the sample period to 1966-1984. He found contrary results. EMH was not rejected for lead and tin.

Roll (1984) found that price movements in the orange juice futures market could predict freezing temperatures in Florida better than the US national weather services could. However, *Roll* indicates that a ‘puzzle’ remains in the orange juices futures market because there is a large amount of inexplicable price volatility. **Canarella and Pollard (1986)** tested the hypothesis that the futures price was an unbiased predictor of the future spot price using both overlapping and non-overlapping data for the contracts of copper, lead, tin and zinc covering the period 1975-1983. Using three different estimation methods, they confirmed the unbiasedness hypothesis.

Fama and French (1987) examined whether the futures prices for copper and other metals contain evidence of forecast power or systematic risk premiums for the period 1967-1984. They showed that the copper futures price contains suggestive evidence of both systematic risk premiums and forecasting power.

MacDonald and Taylor (1988a) tested the EMH for four metals in the LME covering the period 1976-1987. Copper and lead futures markets were found to be efficient. **Gross (1988)** examined unvaried LME prices for the period 1983-84. Based on the mean square error criterion, he provided evidence that the EMH is not rejected for the copper futures market. **Crowder and Hamed (1993)** examined the NYMEX crude oil contracts and concluded that accounting for the cointegration between spot and futures, one cannot reject the speculative efficiency hypothesis during the period March 1983 – September 1990.

Furstenberg and Zapata (1993) evaluated the relationship of the North Carolina corn and soybean markets with respect to the CBOT. Co-integration existed between any pair of these markets and no strong evidence was found to reject the efficiency hypothesis. **Moore and Callen (1995)** examined the Speculative Efficiency of the LME for six base metals between 1985 and 1989. They showed that the long-run speculative efficiency cannot be rejected for the copper and other three metals. **Aulton, Ennew, and Rayner (1997)** re-investigated the efficiency of UK agricultural commodity futures markets using the co-integration methodology. They found that the market is efficient for wheat. Using monthly data, and the Phillips and Loretan (1991) approach, **Peroni and McNown (1998)** supported the speculative efficiency hypothesis for the WTI for the 1984-1996 period.

Gulen (2000) found that the futures price of light sweet crude oil traded at NYMEX plays a significant role in price discovery. i.e. the futures price is an unbiased predictor of the spot price. This observation was also supported by the widespread use of the futures price as a benchmark all over the world as well as by the decision of the U.S. Minerals Management Service to switch to the futures price from the posted price as the standard for calculating royalties. However, his paper explicitly dealt with the crash in 1986. **Murry and Zhu (2004)** investigated the impact of the introduction and exit of Enron Online (EOL) on the efficiency of the U.S. natural gas market. Using a conventional EGARCH model, he found little evidence that the introduction of EOL coincided with the reduction in the market price volatility. **Wang and Bingfan (2002)** studied the efficiency of the Chinese wheat and soybean futures markets using Johansen's cointegration approach. The results suggest a long-term equilibrium relationship between the futures price and

cash price for soybeans and weak short-term efficiency in the soybean futures market. **J B Singh (2004)** attempted to understand the price risk of agricultural and derived commodities for the period 1988-99 in India. He investigated the usefulness of futures market to discover prices, manage uncertainty and risk, and improve the performance of agricultural commodities. He found that among all commodities (pepper, custorseed, potato, gur, turmeric and Hessian), castorseed (Ahemdabad and Mumbai) and pepper futures markets are efficient and unbiased and also performs the role of risk management and hedging effectiveness.

Bhar and Hamori (2006) found that the prices of commodity futures traded on the Tokyo Grain Exchange (TGE) did not move together in the long run. They suggested that the cointegrating relation exists among commodity futures contract from 2000 to 2003 but not earlier during the 1990s i.e the price mechanism works better and the long run relationships among prices becomes more apparent as a market develops. **Bose (2006)** examined the efficiency of commodity futures market in India. He found that notional multi-commodity indices with higher exposure to metals and energy products behaved like the equity indices in terms of efficiency and flow of information. These futures and spot markets help in price discovery.

Lorne N. Switzer and Mario El-Khoury (2006) investigated the efficiency of the NYMEX Division light sweet crude oil futures contract market during recent periods of extreme conditional volatility. Crude oil futures contract prices were found to be cointegrated with spot prices, including over the period prior the onset of the Iraqi war and until the formation of the new Iraqi government on April 2005. **Xin Yu, Chen Gongmeng and Firth Michael (2006)** investigated the efficiency of the Chinese metal futures (i.e. copper and aluminum) traded on China's Shanghai Futures Exchange. Using random walk and unbiasedness hypotheses, they concluded that China's copper and aluminum futures markets were efficient during 1999–2004.

Pete Locke (2006) examined the transparency, liquidity and efficiency of the wholesale natural gas market in the United States, both in absolute terms and compared to other commodity markets. He concluded that natural gas futures were efficient. He found that natural gas prices were quick to reflect changes in information, reflecting great efficiency. On the surface, the

evolution to market prices might appear to increase volatility. **Lokare (2007)** found an evidence of co-integration in both spot and future prices, showing improved operational efficiency in pepper, mustard, gur, wheat, sugar (S), cotton, sesame seed, gold, copper, lead, tin and bent crude oil, rubber, sesame oil, aluminium, zinc, silver and furnace oil markets in India. **Sahoo and Kumar (2009)** examined the efficiency and futures trading-price nexus for gold, copper, petroleum crude, soya oil, and chana (chickpea) in commodity futures markets in India. They concluded that the commodity futures market is efficient for all five select commodities.

Kaur and Rao (2010) studied the weak form efficiency of guar seed, refined soya oil, chana and pepper futures markets in India. They used run test and autocorrelation analysis for testing weak form of efficiency. Using autocorrelation, they found that that all select commodities but refined soya oil futures markets were efficient. The results of run test showed that futures market for all the select commodities were efficient. **N P Singh (2010)** investigated efficiency of futures market of Guar Gum and Guar Seed in India using Error Correction Mechanism (ECM). He concluded that the futures markets for Guar Gum and Guar Seed were efficient in weak form.

Chakrabarty and Sarkar (2010) analysed long term equilibrium relationship between the multi-commodity spot market index (comdex spot) and the futures market index (comdex futures), agricultural commodity spot and futures index, & commodity spot index and Nifty 50. They also examined futures markets of potato, wheat, Masoor Grain and different types of rice at NCDEX. They concluded that commodity spot market indices are cointegrated with the futures market indices as well as Nifty. The price of different qualities of rice was found to be dependent on the recent news and not on the old news.

Ali and Gupta (2011) tested the efficiency of the futures market for twelve agricultural commodities traded at NCDEX. They used Johansen's cointegration analysis and Granger causality tests. They found that there was a long-term relationship between futures and spot prices for most of the select except for wheat and rice. Moreover, bi-directional relationships was found between spot and futures prices of some of the selected commodities in the short run. **Sehgal, Rajput and Dua (2012)** examined ten agricultural commodities futures market for a period from June 2003-March 2011 on NCDEX. They found that markets were efficient for all

but one commodity (Turmaric). Also their results showed bi-directional Granger lead relationship for all select commodities except Turmaric. They concluded that Indian commodity market is still is not competitive for some commodities.

Kristoufek and Vosvrda (2012) examined the market efficiency of 25 commodity futures across various groups like metals, energies, softs, grains and other agricultural commodities using a proposed efficiency Index. They found that the most efficient of all the analyzed commodities is heating oil, closely followed by WTI crude oil, cotton, wheat and coffee. They also inferred the efficiency for specific groups of commodities viz. energy commodities were found to be the most efficient and the other agricultural commodities the least efficient groups.

Murthy and Reddy (2012) studied the relationship between the futures price and spot prices and the farmer's participation. For chili and turmeric, they found that futures prices affect spot prices. Also, they found that "majority of the farmers are not aware of the commodity futures trading and hence do not participate in futures trading". **Gupta and Ravi (2013)** explored the efficiency between commodity futures and spot markets at MCX, NMCE and NCDEX for chana, guar seed, wheat, and potato and cotton seed oil cake. They found evidences of efficiency in most of the sample commodities.

Literature on Inefficiency

Elam (1978) developed a semi-strong test of efficiency. He estimated an econometric model of the US hog market and used it to generate price forecasts. These forecasts were in turn used in a fundamental trading strategy. His trading rule yielded profits over the period studied and led *Elam* to conclude that the hog futures market is not efficient. Similar results were found by **Leuthold and Hartmann (1979)**. They tested the efficiency of the same market by estimating a simple two-equation, demand-supply model to forecast hog prices.

Goss (1981) examined the hypothesis that futures prices were unbiased predictors of the subsequent spot prices for the markets of copper, tin, lead and zinc, using daily price data from the LME for the period 1971-1978. He rejected the unbiasedness of futures prices for lead and tin. **Goss (1985)** revised his paper by introducing joint tests for the same metals of the LME

extending the sample period to 1966-1984. His results showed that the Efficient Market Hypothesis (EMH) was rejected for copper and zinc.

A simple linear regression model was used by **Bigman, Goldfarb, and Schechtman (1983)** to test the efficiency of wheat, corn and soybean trading at the CBOT. Based on F tests, they conclude that futures prices generally provide inefficient estimates of the spot price at maturity. Later, **Maberly (1985)**, **Elam and Dixon (1988)** and **Shen and Wang (1990)** pointed out the result is invalid based on such conventional F tests when the prices series are non-stationary. **MacDonald and Taylor (1988a)** tested and rejected the EMH for tin and zinc. **Graciela Kaminsky and Manmohan S. Kumar (1989)** used excess returns as a measure of efficiency in seven different commodity markets over the 1976-1988 period. Their results indicated that it is not possible to make any strong generalizations on the efficiency of the commodity futures market for short-term forecast horizons. For longer periods, however, it does appear that several of the markets may not be fully efficient.

Sephton and Cochrane (1990, 1991) examined the unbiasedness hypothesis in the LME with respect to six metals for the period 1976-1985. They concluded that the LME is not an efficient market. **Chowdhury (1991)** pointed out the problems of hypothesis testing in the futures market literature and suggested how the co-integration approach can be used to circumvent some of these difficulties. **Moosa and Al-Loughani (1994)** rejected futures market speculative efficiency for the West Texas Intermediate (WTI) contracts for the period January 1986-July 1990. The same hypothesis was rejected for the copper futures contract traded on the LME by **Beck (1994)**. However, **Peroni and McNown (1998)** noted that the Moosa and Al-Loughani conclusion may be unwarranted, as a result of the shortcomings of the test statistics employed.

Aulton, Ennew, and Rayner (1997) found that the market is not efficient for pigment and potatoes. **Kellard, et al. (1999)** examined the efficiency of several widely traded commodities in different markets, including soybeans on the CBOT and live hogs and live cattle on the Chicago Mercantile Exchange. The results showed that the long run equilibrium condition holds, but there

was evidence of short-run inefficiency for most of the markets studied. The degree of the inefficiency was measured based on the forecast error variances.

Mckenzie and Holt (2002) tested market efficiency and unbiasedness in four agricultural commodity futures markets – live cattle, hogs, corn, and soybean meal – using cointegration and error correction models with GQARCH-in-mean processes. They found that each market is unbiased in the long run, although cattle, hogs and corn futures markets exhibit short-run inefficiencies and pricing biases. Models for cattle and corn outperform futures prices in out-of-sample forecasting. **Wang and Bingfan (2002)** found that the futures market for wheat is inefficient in China, which may be caused by over-speculation and government intervention.

Ahmed El H. Mazighi (2003) checked the efficiency of futures markets for natural gas. He found that efficiency is almost completely rejected on the both the International Petroleum Exchange (IPE) in London (UK Market) and the New York Mercantile Exchange (NYMEX) the US market. **Kenourgios and Samitas (2004)** showed that the copper futures contract market on the LME is inefficient and did not provide unbiased estimates of future copper spot prices. They tested for both long-run and short-run efficiency using cointegration and error correction model.

J B Singh (2004) found that turmeric markets were inefficient and biased in India for the period 1988-99. **Wang, H. Holly et al. (2005)** studied the efficiency of the Chinese wheat and soybean futures markets. The results of Johansen's cointegration approach suggested a long-term equilibrium relationship between the futures price and cash price for soybeans and weak short-term efficiency in the soybean futures market. The over-speculation and government intervention were suggested reasons for wheat futures market inefficiency. **Qingfeng “Wilson” Liu (2005)** examined the relations among hog, corn, and soybean meal futures price series using the Perron (1997) unit root test and autoregressive multivariate cointegration models. Accounting for the significant seasonal factors and time trends, they found that inefficiency exists in these three commodity futures markets.

Easwaran and Ramasundaram (2008) analysed the efficiency and price volatility of select four commodities (castor, cotton, pepper and soya) on MCX and NCDEX. These markets were found

to be inefficient. They explained that the inefficiency was due to several factors like thin volume and low market depth, infrequent trading, lack of effective participation of trading members etc.

Soni and Singla (2012) analyzed the market efficiency of Guar gum futures market NCDEX using an error correction model and GARCH-M-ECM. They found Guar gum futures market was inefficient. They suggested over-speculation or market manipulation as the probable reason for inefficiency. **Inoue and Hamori (2012)** tested for weak form efficiency using MCX's spot and futures index-comdex for a period from Jan 2006 to March 2011. They used the dynamic OLS (DOLS) and the fully modified OLS (FMOLS) methods. They found that the commodity futures market was not efficient for the entire sample period but for the sub period July 2009 to March 2011. They concluded that commodity futures market exhibits weak form efficiency as the market size expands.

From above presented literature we can say that the results of these studies have been mixed and the efficiency hypothesis is supported only for certain markets and only over some periods. The findings of studies show that some commodity futures markets are efficient while others are inefficient.

Literature on Related Issues

There are various issues related to efficiency of commodity futures market. The one of such issues is the effect of seasonality on efficiency. **Newbold et.al. (1999)** investigated the effects of seasonality in testing efficiency over a range of commodities. Using quasi-ECM model, at both short and long forecast horizons they found evidence that the seasonal terms were significant i.e. the market was inefficient. The information about the seasonal pattern was not embodied in the basis and could be used by agents to predict future spot prices movements. **Sorenson** provided a framework for estimating model parameters, and especially seasonal parameters, using both the time-series characteristics and cross-sectional characteristics of agricultural commodity futures prices for the period 1972 to 1997. Estimation results were provided in the case of corn, soybeans, and wheat using weekly panel-data observations of futures prices from CBOT. He found that normal backwardation for soybeans and wheat while the situation for corn was mixed besides the estimated seasonal features. Also, he suggested normal backwardation to be the case for long contract maturities while contango be the case for short contract maturities.

The second related issue is inflationary impact of commodity futures. **Sahi and Raizada (2006)** investigated the efficiency of wheat futures market at NCDEX and analyzed its effect on social welfare and inflation in the economy. They used Johanson's Cointegration approach for different futures forecasting horizons ranging from one week to three months. Wheat futures market was found to be inefficient in short run and social loss statistic also indicated poor price discovery. The growth of commodity futures volume was found to have significant impact on the inflation in the economy. **Sahoo and Kumar (2009)** examined the impact of futures trading on inflation. They did not find sufficient evidence for inflationary impact of futures market. **Gupta and Ravi (2013)** explored the efficiency between commodity futures and spot markets at MCX, NMCE and NCDEX for chana, guarseed, wheat, potato and cotton seed oil cake. They found evidences of efficiency in most of the sample commodities. Further they examined the association between the spot price of commodities like Chana, Guarseed, Refsoyaoil, Gold and Silver, and WPI. Spot prices of commodities were found to be responsible for rise in WPI inflation.

The effect of commodity futures trading on volatility of commodity spot market is the third issue that has been discussed here. **Weaver and Banerjee (1990)** found that that futures trading for cattle and other related commodities did not lead to dynamic instability of cattle price despite the external information's role in determining cattle price. **Antoniou and Foster (1992)** analyzed the effect of futures trading on spot price volatility for Brent crude oil in UK. Using GARCH method they found that there was no volatility spillover from futures to spot market. **J B Singh (2004)** examined the hessian spot market price variability before and after (over the period 1988-97) the introduction of futures trading. He investigated the impact of futures market on inter-seasonal and intra-seasonal price volatility. He found that the cash market volatility, mainly inter-seasonal volatility, was has reduced after the introduction of hessian futures market. **Karande (2006)** in his doctoral thesis found that the introduction of castor seed futures market at Mumbai and Ahmedabad has had a beneficial effect on the castor seed spot price volatility. **Bose (2008)** used notional price indices of commodity markets covering metals, energy and agricultural products. Energy and metal indices exhibit informational efficiency of commodity futures market with stabilizing effect on volatility of underlying market.

Nath and Ligareddy (2008) found that futures trading had a destabilizing effect on spot market. Results of regression, correlation and Granger Causality indicated that introduction of futures trading led to increase in price of urad significantly. Spot prices of these commodities declined after the ban on futures trading was introduced. Price volatility was also increased during the period, when trading in futures was allowed. Wheat price increased in post futures period but the same was also coincided by steep fall in supply. **Dey, Maitra and Roy (2011)** studied cointegration and volatility spillover in Indian pepper futures market. They found a unidirectional causality from futures to spot prices of pepper. They concluded that the volatility of one market leads to another market. They found a bi-directional spillover effect under GARCH model but unidirectional under EGARCH i.e. from futures to spot.

Scope for Further Study in Commodity Futures Market

In view of literature reviewed, various concerns are raised in commodity markets that need to be addressed and investigated through research. Some of the research gaps that have been identified relate to integration with international markets, macroeconomic issues, microstructure issues of commodity futures market etc. These have been discussed below.

- No other market seems to have such extensive international macroeconomic linkages as does the commodity market. When commodities are emerging as an asset class-*earning superior risk adjusted returns* compared to stock markets or bond markets (*Domanski and Heath (2007) and Mishra (2008)*), there is dearth of studies on important issues like integration of Indian commodity market with foreign markets.
- In a developing market like Indian Commodity market, Market Microstructure has been ignored. Some studies were conducted on commodity market microstructure in India in the '60s and '70s. But these studies lacked the analytical quantitative rigour. Out of a few research papers on microstructure, Bhanumurthy (2004) is an important study on Indian foreign exchange market microstructure. Naes and Skjeltorp (2006) studied stock market microstructure. These studies are either in stock market or foreign exchange market. So microstructure research in commodity market in India has great scope.
- Futures market efficiency is one of the most extensively researched topics in the empirical literature. From the government policy point of view, an efficient market means

a better alternative to market interventions such as imposing price stabilization policies (*Sahadevan(2002), Thomas (2003), (Pavaskar and Ghosh, 2008), Chakrabarti and Ghosh (2009)*). The results produced are often conflicting: the efficiency hypothesis is supported only for certain markets and only over some periods. Although some of the conclusions reached in the literature reflect genuine efficiency or inefficiency, some of them may reflect the lack of attention paid to the institutional aspects governing the functioning of futures markets.

- The most relevant aspect for agro-commodities, although not yet extensively investigated, is seasonality. (*Wang and Bingfan (2002), J B Singh (2004), Wang, H. Holly et al. (2005), (Newbold et al., 1999)*). The study of the effect of seasonality on the efficiency of agro-commodities futures market becomes even more important in agriculture denominated country like India.
- In a country like India, where there have been allegations of inflation on commodity futures trading, an empirical investigation is utmost important and hence required. For instance, Govt. of India decided to suspend the futures trading in urad, tur and wheat in early 2007 due to the same reason. Moreover, the Expert Committee to study the impact of futures trading on agricultural commodity prices, chaired by *Abhijit Sen (2008)*, failed to arrive at any unanimous conclusion.

Conclusion

The study of market efficiency in commodity futures markets is important to both the government and the producers/marketers in India. Moreover there are some other important issues related to market efficiency viz. effect of seasonality in agro-commodities, inflationary impact of commodity futures and volatility spillover between spot and futures market. So in this paper, we have reviewed the available literature on commodity futures market efficiency and related issues mentioned above. The review showed that the results produced in available literature are often conflicting: the efficiency hypothesis is supported only for certain markets and only over some periods. Also from literature review, some areas have been identified that need attention of researchers. These are commodity market microstructure, macroeconomic issues in commodity futures market, inflationary impact of commodity futures market and

integration with other international markets and effect of sub-prime crisis. This forms further scope of research in this area.

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