Price Discovery and Spillovers in Indian Agricultural Commodity Markets

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Paper Abstract: Traditionally, the agricultural commodities are traded in segmented mandis (agriculture trading hubs) throughout India, but emergence of electronic derivative markets since 2002-03 have started playing important roles of price barometer, risk management, price stabilization and price discovery which are expected from them. However, it has been observed that these electronic markets are promoting speculation and thus, defeating the basic purpose for which they were created. As a consequence, the Indian government has started exercising rigorous controls to curb speculation in commodities markets. But, still there is a debate and lot of research is being conducted whether the emergence of electronic derivative markets are really playing the roles of risk management, price stabilization and price discovery or still they are purely speculative and encouraging a disconnect between the market prices and true and fair prices of commodities in India.

Present empirical literature has failed to bring out decisively whether there is a healthy impact of futures trading on spot prices. Sen Report, 2008, highlighted that although the volume of derivative trading in India had grown phenomenally in the futures market, it was greatly dominated by speculators and it had failed to provide instrument of risk management.Whereas other research findings have documented that trading on futures market increases market depth of the commodity, leads to rapid dissemination of information and better price discovery (Fligewski, 1981, Bessembinder and Seguin, 1992). In the Indian context, volatilities of urad, gram and wheat prices were higher in the post futures trading period than pre futures trading period (Nath and Lingareddy, 2008). The debate on efficacy of derivative markets in performing the role of price discovery for agricultural commodities still continues.

The objective of this study is to empirically investigate role of derivative trading in price discovery of agricultural commodities and volatility and liquidity spillover across spot and future market. The study is conducted for eight commodities Channa, Gaur Seed, Kapas, Soybean, Pepper, Potato, Refined Soya Oil and Wheat traded on the National Commodity and Derivative Exchange. It investigates price discovery of assets in two parts: long run equilibrium between future and spot market and short run adjustment process. The work is done in two phases. In the first phase, the study examined price discovery of agricultural commodities by determining the

existence of long run equilibrium between future and spot market and short run adjustment process. In the second phase, the volatility and liquidity spillovers is examined between future and spot market.

Findings of the study

In the first phase, the spot and future price series is tested for order of integration and then the Johansen cointegration test (1990) is applied for determining long run equilibrium. The results show that the long run equilibrium relationship exists in all commodities except for Kapas. This result is in contradiction to the findings of Roy (2008). According to Roy (2008), Wheat markets were not in a long run equilibrium relationship. The commodities which have a cointegrating relationship are then tested for short run adjustment process. The speed of adjustment of both the markets and the impact of lags fading out is studied by VECM. The results reveal that future markets play a dominant role in giving price signals to spot market for five out of seven commodities examined. And the change in 1-day lag term of future prices has a significant effect on the spot price change for most of the commodities.

Phase two of the study analyzed the volatility and liquidity spillover across spot and future market. The volatility is modeled using EGARCH and spillover across markets is examined using granger causality test. While the liquidity is modeled as unexpected trading volume and spillovers across markets are examined. The granger test reveal that for Channa, Gaurseed, Kapas, Refined soy oil and Wheat spot volatility led future volatility. The results are in conformity with Mahalik et al. (2009) that for the agricultural commodities the spot led the future market in India. The findings of the study also show that volatility spillover from one market lead to increase in volatility in the other market. In part 2, the study models liquidity as the unexpected trading volume for future and spot market. The results reveal that unexpected trading activity in spot market leads to liquidity shocks in future market for five commodities, namely Channa, Gaur seed, Soybean, Pepper and Refined soy oil. For liquidity spillover, the rise in the unexpected shock in one market leads to a fall in the liquidity of the other market.

Some important implications of the study are as follows:

1) Policy makers and government agencies can use the results of this study to analyze the role of future market. Future market can perform the function of Price discovery for agricultural commodities only if future and spot markets are cointegrated in the long run. The future and spot market of Kapas does not have a long run equilibrium relationship. Thereby, future trading of Kapas requires structural policy changes. Government can initiate steps for substantial involvement of producers of Kapas in the derivative exchange.

2) To deepen the markets the government needs to encourage participation of hedgers in the future market. The hedging activity can be promoted with better infrastructure facilities like low storage costs, warehouse receipts and electronic spot exchange for better information symmetry. The farmers can be encouraged to participate in the derivative trading by introduction of commodity options. Commodity options provide direct benefit farmers.

3) Commodity portfolio managers and investment analyst can use the results to formulate hedging strategies. For analyst the direction and speed of volatility and liquidity spillover indicate the timing of investment in commodities.