Commodity Price Hedging with Agribusiness Stocks

Beginning in the early 2000s commodity markets, especially commodity futures, have been perceived as a new and attractive asset class for financial investors who want to diversify their portfolios. This upsurge in commodity index fund investment attracted the attention of many academicians and practitioners to the relationship between commodity futures returns and index trader positions (e.g., Sanders and Irwin 2011, Tang and Xiong 2012). More recently, Peterson (2013) analyzed possible returns for the most widely watched commodity index, the S&P GSCI. While interest has increased in the impact of stock market investors in commodity markets, what is less investigated is the opportunity for traditional commodity market participants to use the stock market to their benefit. A few exceptions include Schnitkey and Kramer (2012) and Zapata, Detre, and Hanabuchi (2012).

Trading in futures markets has become very expensive due to increased margin calls, particularly during the commodity boom. This raises the question of whether hedgers would be better off using the stock markets to hedge rather than the futures markets. More specifically, can the agricultural producers and processors build a portfolio of agribusiness stocks that can match or improve the hedging performance that can be achieved using either the futures markets or with commodity indices such as S&P GSCI and Dow Jones-UBSCI?

To answer these questions we first need to establish the relationship between the stock prices and futures (or spot) prices. If a relationship exists then we can consider building an investment portfolio with the stocks of publicly traded food companies and test if this portfolio leads to higher return and lower risk compared to investments in futures markets. The main issues that need to be addressed in the empirical analysis are: (1) construction of an index, (2)

testing for correlation or cointegration, (3) identification of structural breaks, and evaluation of hedging performance of the optimal stock portfolio.

For the construction of an index for food companies' stocks we follow the general method in Schnitkey and Kramer (2012). These authors developed an "AgIndex" by using stock prices of publicly traded agricultural companies, mostly input suppliers. In this paper we will focus on companies in the food industry.

Studying correlations over time requires the price or return series to be stationary. If the asset prices (or returns) are nonstationary then cointegration tests should be used to identify any long-run relationship between the asset prices (returns). To test for nonstationarity and cointegration, we will utilize Bayesian procedures developed by Dorfman (1993, 1995) which can be applied to both univariate and multivariate models.

Irwin and Sanders (2012) identify (without any formal econometric tests) main structural changes in commodity futures markets in the last decade. These include the introduction and expansion of electronic trading, easier access to futures markets, and increased passive investments in futures markets. These possible structural changes should be tested for and appropriately accommodated in our analysis. To this end, we propose to use a Bayesian method developed by Wang and Zivot (2000) to test for multiple structural changes in time series. In this model the determination of the number of structural breaks and the form of structural change is considered as a problem of model selection.

Our results will help agricultural producers and food manufacturers to understand the dynamics between the two financial markets (stock and futures). Depending on our empirical results we may identify a new approach to diversify their asset holdings in these markets and thus reduce their price risk.

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