Introduction

- The prices of corn and soybeans, the nation’s top two crops in total production, recently doubled and then sharply declined.
- The press attributes much of this run-up in commodity prices to the swelling demand for ethanol fuel and the decline to a pullback in this demand.
- This food vs. fuel debate is magnified by the lack of information on the interrelation among agricultural commodity and ethanol prices.
- Understanding and predicting price leadership between ethanol and the corn and soybean agricultural commodities leads to better policy.

Data

Five weekly wholesale price series from March 1989 through December 2007:
- Ethanol prices (EIA and Biodiesel News)
- Corn prices (USDA Ag. Marketing Service)
- Soybean prices (USDA Ag. Marketing Service)
- Conventional gasoline prices (Energy Information Ad.)
- Oil prices (Energy Information Ad.)

Each series is tested for the presence of a unit root using Dickey-Fuller test and augmented Dickey-Fuller test.
- All first differencing of the logarithm of the price series reject the null hypothesis at a 5% significant level, indicating stationary.

Hypothesis

- Theory explains the demand for agricultural commodities as a derived demand, where the price of the final good (ethanol) influences the quantities and thus prices of the intermediate goods (agricultural commodities).

Research Questions

The food vs. fuel security issue is addressed by answering the following questions:
- Are there long-run links among ethanol, corn and soybeans prices? NO
- Are there any short-run links among these prices? YES

Analysis

Cost integration
- Two or more price series are said to be cointegrated if the prices move together in the long-run
- As a test for presence of cointegration among the price series, the Johansen trace test is performed
- One cointegration relation is revealed

Vector Error Correction Model (VECM)
- Specifies the short-run dynamics in a framework that anchors the dynamics to long-run equilibrium relationships

\[ \Delta y_t = \pi + \sum_{i=1}^{p} \phi_i \Delta y_{t-i} + \epsilon_t \]

where \(\Delta y_t\) is a vector of percentage change in logarithm prices, \(\pi\) and \(\phi_i\) are the vector and matrices of the parameters to be estimated. \(\epsilon_t\) is the lagged error correction term.

Conclusions

- Results support ethanol and oil demands as derived demand from vehicle fuel production.
- There are no long-run relations among fuel (ethanol, oil and gasoline) prices and agricultural commodity (corn and soybeans) prices.
- Recent upward direction of agricultural commodity prices may have been supported by an ethanol demand shift, but the results indicate such a shift is only transitory.

Implications

- For the food versus fuel security issue, results support the effect of agricultural commodity prices as market signals which restores commodity markets to their equilibrium after a demand or supply event (shock).
- Such shocks may, in the short-run, increase agricultural commodity prices, but decentralized freely operating markets will mitigate the persistence of these shocks.

Consideration may then be directed toward shifting U.S. agricultural policy for mitigating such short-run shocks with commodity buffers for supplementing supplies in years of insufficient harvests.

Reference


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