Effects of Alternative Marketing Arrangements on Spot Market Price Distribution in the U.S. Hog Market

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Packers have relied more and more heavily on alternative marketing arrangements (AMAs) to satisfy their slaughter needs. As a result, spot market now only accounts for less than 5% of the transactions in the hog market. What are the effects of AMAs on spot market?

Research in the literature has shown:

a. Effect of AMAs on spot market price level is mildly negative or ambiguous.
b. AMAs increase spot market price volatility.

We show that AMAs affect spot market price level through two channels rather than just one:

a. Direct: on price level as studied in the literature
b. Indirect: affect spot market price volatility first and then volatility affects price level

Ignoring the indirect effect may lead biased estimates.

Objectives

Propose a model that elucidates the two channels through which AMAs affect spot market price.
Quantify both the direct and indirect effects of AMAs on spot market price level.
Quantify both the short-run and long-run effects of AMAs on spot market price level.

Methods

Theoretical Model

2 periods: quantity decisions are made in the 1st period and transactions happen in the 2nd
2 channels: spot market and AMAs
perfect competition among farmers
perfect competition among packers

Empirical Methods

GARCH in Mean model for spot market price time series:

- Price level equation: ADL-ARMA specification in which spot market volatility is a determinant
- Price volatility equation: standard GARCH specification

Data

Source: Mandatory Price Reports Data from USDA-AMS
Daily transaction price and volume data by marketing channel for 2002-2010

Overview

Results

The direct effect of AMAs on spot market price level is negative.
The indirect effect of AMAs on spot market price level is positive:
AMAs increase spot market price volatility
Spot market price volatility increases spot market price level.
The net effect of AMAs on spot market price level is negative.
Due to the high serial correlation nature of the spot market price time series, the long-run effects are larger than previously estimated:

- Long-run direct effect: 1% increase in AMAs reduces spot market price by $5 per 100 carcass pounds
- Long-run indirect effect: 1% increase in AMAs increases spot market price by $1.75 per 100 carcass pounds
- Long-run net effect: 1% increase in AMAs reduces spot market price by $3.25 per 100 carcass pounds, which is about 6% of the average price in the sample period.