Post Livestock Mandatory Price Reporting: An Assessment of Effects on Cattle Cash Prices

Man-Keun Kim
Assistant Professor
Department of Applied Economics
Utah State University
Logan, UT 84322
E-mail: mk.kim@usu.edu

Hernan A. Tejeda
Postdoctoral Fellow
Department of Applied Economics
Utah State University
Logan, UT 84322
Email: hernan.tejeda@usu.edu


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1. Motivation

- The objective of this paper is to identify the effect of livestock mandatory price reporting (MPR) on cattle cash prices.
- Specifically determine if cash prices were higher post MPR implementation - as supporters of MPR legislation contended (Koontz, 2011).
- The MPR of 1999 was implemented in April 2001. In July 2010, the MPR is extended to end in September 2015.
- With more complete price and transaction data available to the public than previously existed under voluntary reporting, an increase in integration between spatial markets higher market transparency is anticipated.
- Studies have focused on the impact of MPR on market integration and information, not on (fed) cattle prices itself. This research seeks to shed light on this question applying an ad hoc analysis to determine if post-MPR fed cattle prices (and other beef related prices) increase and, if so, by how much.

2. Literature Review

- Following the MPR act, various theoretical studies have addressed matters of market behavior among packers, operational preferences and the variability of prices, as well as cattle feeder’s benefits, among others. (Azzam, 2003; Azzam and Salvador, 2004; Njoroge, 2003; Njoroge et al., 2007; Boyer and Brossen, 2013).
- Pendell and Schroeder (2006) and Fausti et al. (2007) study spatial market integration among regional cattle-feeding states, and within a particular state, respectively. The first find an increase in market integration following MPR implementation, while the latter study does not.
- Perry et al. (2005) find that price volatility increased after MPR, in contrast to previous Azzam (2003) results.

3. Data

- Monthly data (from January 1990 to December 2006) that describes the US cattle market from various sources:
  - Fed cattle price (Nebraska live heifer: FED_CTL_P - LMIC), Feeder price (Oklahoma feeder price: FEEDER_P - LMIC), Beef cutout price (Choice: BEEF_WH_B - LMIC), Nearby feeder futures price (FEEDER_FUTURE - CRB), and captive supply (CAPTIVE - GIPSA).
- Price movement

4. Methods and Estimation

- An ad hoc approach is applied by using a Lag-augmented vector auto-regression model resulting in two lags (LA VAR):
  \[
  y_t = c_0 + c_1 MPR + c_2 t + \sum_{k=1}^{12} \delta_k m_k + A_1 y_{t-1} + A_2 y_{t-2} + \epsilon_t \quad (1)
  \]
  \[
  y_t' = [y_1, \ldots, y_d]' \quad MPR = \text{dummy}, \quad m_t = \text{monthly dummy}, \quad i = 1, \ldots, 11, \quad t = \text{trend}, \quad c_0, c_1, c_2 = 6 \times 1 \quad \text{coefficient matrices}, \quad \text{and } \sum_{k=0}^{6} \epsilon_t \quad \text{exc. 16 coefficient matrices for kth lagged } y
  \]
- The Moving Average representation (MAR), \( y_t = \sum_{i=0}^{6} \theta_i e_{t-i} \), converted from the estimated LA-VAR, is used to study dynamic structure.

5. Historical Decomposition

- Historical decomposition: red solid line is the base projection using equation (2) and black dot line is the actual price (unit: $/cwt)

- Impulse response function (below) suggests that beef cutout price (BEEF_WH_P) dominates prices movement except at captive supply (3rd column) while beef cutout price is not responsive to other variables (1st row).
- Fed cattle price (FED_CTL_P)(1st row) is sensitive to beef cutout value. Note that captive supply has negative impact to fed cattle price.

*Authors M-K Kim is an Assistant Professor (mk.kim@usu.edu); H. A. Tejeda (herman.tejeda@usu.edu) is Postdoctoral Fellow, Department of Applied Economics, Utah State University