Canadian Cattle Cycles and Cycle Effects of Market Shocks

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INTRODUCTION

- It has been well-established that beef cattle industries in the major beef producing countries are highly cyclical. The cyclical nature not only plays into the decisions that individual producers make in optimizing their returns, but also has implications for government policy, especially in response to negative shocks to the industry.

- Although the contraction phase is generally perceived as the most challenging aspect of the cattle cycle for producers, the increasingly dynamic nature of cycles in terms of changing duration and amplitude has greatly diminished the predictability of cycles, rendering producers incapable of making accurate long-term predictions of supply and demand conditions.

- The Canadian beef industry has experienced structural change since the 1970s and four major shocks in the last decade, both of which are likely to have impacted the Canadian cattle cycle.

OBJECTIVES

1. Estimate cycles in four industry variables:
   i. Total cattle inventories
   ii. Beef cow inventories
   iii. Beef supply
   iv. Beef prices

2. Estimate the cycle effects of two of the most recent market shocks:
   i. Appreciation of the Canadian dollar relative to the U.S. currency
   ii. Feed price escalation

METHODS

- An autocorrelation function (Bartlett, 1955) is generated for each variable for initial clues to the nature of cycles therein.

- Spectral analysis (Hamilton, 1994) is performed on each series to estimate the cycles.

- Intervention analysis (Enders, 2004) is combined with spectral analysis to estimate the impact of market shocks on the harmonic components of each series, and hence on the amplitudes of the cycles.

RESULTS

Autocorrelation functions as derived from Bartlett’s formula

CONCLUSIONS

- Total cattle inventories, beef cow inventories, and beef supply are characterized by 10-year cycles.
- Beef prices have an 8-year cycle.
- Seasonal 3-month and 1-year cycles exist in beef supply and prices, respectively.
- Both exchange rate and feed price shocks significantly affected total cattle inventories but neither shock had an effect on beef cow inventories.
- The exchange rate shock significantly increased beef supply.
- The exchange rate shock has led to a 9-month reduction in the duration of the beef supply cycle, and a 58% reduction in the cycle’s peak amplitude. No effect is observed on the 3-month seasonal cycle.

References


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