

Public Abstract

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The objective of this dissertation is to examine efficient price transmission mechanism and efficient supply system in livestock sectors. The first essay investigates market integration and spatial price transmission in beef trade among the TPP countries (Australia, United States, Canada, New Zealand, and Japan) by using monthly beef prices. The estimates of the magnitude and the short-run speed of adjustment for one price to the shocks of another between two countries is useful information in assessing how well change in one price is transmitted to another and what types of price transmission (symmetry or asymmetry) occur in beef trade. This helps to identify the existence of potential market inefficiencies that result from asymmetric adjustment and which country leads the price relationship in beef trade. For this purpose, Engle-Granger and Johansen co-integration tests are conducted. In addition, threshold autoregressive (TAR) model and momentum threshold autoregressive (M-TAR) model, and asymmetric (or symmetric) error correction model (ECM) are estimated to examine the patterns of price adjustment. The findings indicate that the all pairs of prices are found to be statistically significant for the co-integration test. This suggests that there a long-run equilibrium relationship between pairs of price series and the various types of beef traded by the TPP countries are likely to be substituted for each other in each market. In addition, the results of the TAR and M-TAR models provide sufficient empirical evidence in support of asymmetric pricing behavior in beef trade among the TPP countries, mostly showing that the rate of adjustment to negative shocks to long-run equilibrium tends to occur more rapidly than that for the positive price shocks among the TPP countries. To examine the short-run dynamic of beef trade among the TPP countries, two types of the ECM are estimated. The estimates of the error correction terms indicate that the response of one price depends on either positive shocks or negative shocks in another price among the bilateral relationships analyzed, and they show different speeds of adjustment to the long-run equilibrium and different price leadership, respectively. The asymmetric pattern of price adjustment may attribute to product differentiation through different feeding methods, trade policy, and market concentration in each country. Due to these factors, relatively slow speed of price adjustment to the equilibrium can cause potential losses to market participants in each market, and therefore it should be corrected in order to improve market efficiency in beef trade among the TPP countries.

The second essay aims to investigate asymmetric supply response of cattle, hog, and chicken in the U.S. This concern can be described in the context of structural change of U.S. meat markets. That is, the move to larger operations that have resulted from the economies of scale that exist in many of these sectors today results in an inability to adjust to low prices because of the high capital outlays associated with the large facilities yet these same economies of scale allow for quick expansion in periods of high prices. For this purpose, the threshold autoregressive (TAR) model and momentum threshold autoregressive (M-TAR) model are performed. The empirical results of the M-TAR model suggests that there is the evidence in support of the presence of asymmetric supply of hog and chicken. In contrast, the M-TAR model supports symmetric supply response for cattle. Only the finding for hog industry is consistent with the a priori expectation that the positive deviation from the long-run equilibrium created by the producers' expectation of high profitability may tend to quickly adjust to a new equilibrium while the negative discrepancy created by the producers' expectation of low profitability tends to persist. Overall, the empirical results suggest that there is evidence in support of symmetric supply response for cattle industry, while there is the presence of asymmetric supply response for hog and chicken industry. These findings imply that the recent structural

change in cattle industry contribute to improving the production efficiency for cattle, but in hog and chicken industry, there might exist potential production inefficiencies.

The purpose of third essay is to examine asymmetric price transmission in the U.S. pork market. The motivation of this study is found in the structural change in the U.S. pork market that is characterized by more extensive and intensive operations, consolidation of the small and medium scale producers, and the many mergers and acquisitions of meat packers and retailers. In consideration of the various stages of the market linked primarily by price mechanisms, the degree and the speed of adjustment to which prices are transmitted in the marketing chain can play a role in understanding how price transmission works in terms of market efficiency and in assessing direction and distribution of welfare effects in a normative fashion. For this purpose, threshold co-integration analysis is applied by allowing for asymmetric pattern of price adjustment towards a long-run equilibrium in the price relationship between farm and wholesale, and retail levels. The asymmetric error correction model is specified to estimate the short-run adjustment speed of price response towards a long-run steady state. The empirical findings suggest that there might be asymmetric price adjustment in the U.S. pork market while its pattern appears to be different across marketing channels. That is, the response of wholesalers tends to be quicker to increases in producer price (i.e., margin squeezing) than to decreases in producer prices (i.e., margin stretching), while wholesale prices respond more quickly to decreases in retail prices. These may be generally understood in the presence of non-competitive pricing behavior of agents at a certain chain beyond farm gate. Such findings imply that the recent structural changes in the U.S. pork market may hinder efficient price transmission mechanism across the marketing channels.