Research of Suitability of The Ankara Meat Exchange with The Efficient Market Hypothesis

H. Serdar YALÇINKAYA
Necmettin Erbakan University
Konya Ereğli Kemal Akman Vocational School
Konya, Turkey
orcid.org/0000-0002-5064-5144
syalcinkaya@konya.edu.tr

Extensive Summary

Introduction

Food supply security is one of the most controversial issues in the modern world. The most fundamental aspect of food supply security is that the continuity of agricultural activities which means that the farmers' production continue at an adequate level. However, as a result of many researches, it is seen that the income, farmers earn from their production through their continuing activities, becomes the most important issue. Farmers' volatility in agricultural product prices makes their budgets, in other words financial planning difficult. Accordingly, in order to increase the realism of the prices of agricultural products, the Commodity Exchange, operating under the Turkish Chamber of Commerce and Industry Law No. 5174 dated 18.05.2004, had the final legal arrangement. The Ankara Mercantile Exchange started its activities in 1927 and became specialized in 1960 as AMM (Ankara Meat Market).

The reason for the fact that AMM is the indicator price source in red meat market in Turkey, the effectiveness of prices in the stock market is of great importance in terms of livestock financing. In the first part of the study, the effective market structure of the stock market is explained theoretically while in the second part, the studies considered important in the related literature are summarized and in the application section, the market activity unit root tests of AMM are analysed.

Effective Market Hypothesis

The effective market hypothesis is to realistically determine market prices based on the symmetric distribution of information. Market efficiency are explained in three categories as weak form, semi-powerful and strong form of activities (Zeren, et al., 2013: 142; Fama, 1970: 385).

Ankara Meat Market

The Dersaadet Bond Stock Exchange, established in 1866 by the decree of the Ottoman Empire, is accepted as the first stock market (Ceylan, 2001:371). The first commerce exchange was established in İzmir in 1891 (Doğan, 2010: 47). According to TOBB (Turkish Chambers and Commodity Exchanges of Turkey) in 2017, 113 commodity exchanges operate in Turkey. Ankara Commodity Exchange started its activities in 1927 under the name of Ankara Zahire Exchange and in 1960 it took its name as Livestock and Meat Stock Exchange and has continued its activities until today. In addition, meat prices from official channels are AMM stock quotes (ATB, 2017).

Method

The ATE's effectiveness is being explored using the weekly data for the 2010-2016 period of the AMM (Ankara Meat Market) connected to the AME (Ankara Mercantile Exchange). There is no systematic daily transaction in the AMM and at least two days are processed every week. Accordingly, weekly time series were created by using weighted averages of purpose and daily values to ensure regularity of the time series over time intervals, and logarithms of these series were taken and analysed. There are two different price indexes for two different products in AMM. These are the lamb carcass meat price index and the beef carcass meat price index. separate stock market activity analyses were conducted for the two different indices.

Time series for veal carcass meat:

ln(dort): weekly beef carcass average unit meat price (TL/kg)

ln(dmin): weekly beef carcass lowest unit meat price (TL/kg)

ln(dmax): weekly beef carcass highest unit meat price (TL/kg)

ln(dkg): weekly beef carcass total transaction amount (kg)

ln(dtl): weekly beef carcass total transaction amount (TL)

The procedures applied to the veal carcass meat time series were applied to the lamb carcass meat time series and the following time series were created.

ln(kort): weekly lamb carcass average unit meat price (TL/kg)

ln(kmin): weekly lamb carcass lowest unit meat price (TL/kg)

ln(kmax): weekly lamb carcass highest unit meat price (TL/kg)

ln(kkg): weekly lamb carcass total transaction amount (kg)

ln(ktl): weekly lamb carcass total transaction amount (TL)

The efficiency of the resulting carcass sheep and calf price indexes will be determined by testing the indexes as deterministic and random in the literature. The fact that a series is not stationary is considered as a result of being deterministic and it can provide a lot of gains different from the market by producing various functions over the series (Yavuz, 2015: 283; Enders, 2010). It is understood that the resulting index depending on that is ineffective.

ADF and PP unit root tests were used to test the stability of the series under investigation. In order to investigate the effect of inflation when unit root tests were performed, indices were examined separately on TL and $ units.

It is suggested to use extreme value volatility estimators along with historical variance and standard deviation data on the time series for the determination of volatility (Yavuz, 2015: 428; Parkinson, 1980). The highest and lowest price data are used in the calculation of overvaluation volatility estimators during the day or during the price formation period (Yavuz, 2015: 428). The time series, lamb and veal price indices for the study were calculated using the extreme value volatility estimators (1) and weekly volatility time series for each index were established.

$$\sigma_p^2 = \frac{(lnH_t - lnL_t)^2}{4ln2}$$

(1)

σ: Weekly volatility

H_t: highest price in t time

L_t: lowest price at t time

GCA (Granger Causality Analysis) was carried out with the aim of investigating the relationship between each variable and each other using the time series and volatility time series that were created earlier.

Findings

Unit root tests performed on the variables defined in the application section were performed on both TL and $ values.

Based on the ADF and PP test results, both sheep and calf carcass price indexes on both TL and $ values were found not to be stable at the level but stable at the 1 st degree of difference. Accordingly, the hypothesis that the tested indices are deterministic will be rejected and the indices will assume to be random movements. According to the assumption that the indices are moving randomly, the AMM denies that beef and sheep meat markets are not active in weak form.

After the AMM proved to be effective market in weak form, the GCA was carried out to determine the relationship between the average price of the beef and lamb markets, the amount of transactions (kg) and the interrelationships between volatilities and their relationship.

According to GCA results, the average prices of calves are the reason for the prices of lamb, while the prices for lamb are not the prices of calf average prices. While the volatility of beef prices is the reason for the price of lamb, the volatility of lamb prices is not the reason for the price of beef. The amount of veal treatment and the amount of lamb treatments do not significantly affect each other in a mutually significant manner. Depending on these determinations, the elements of calf market (transaction volume, price and volatility) affect lamb market components. However, the influence of the lamb market on the calf market has not been determined.

In the veal market, the transaction amount is the average price, while the average price has no effect on the transaction amount. The average price and volatility in the

veal market are mutually the cause of each other. While the amount of transaction in the calf market is the reason for the volatility, the volatility is not the reason for the transaction amount.

While mutual causality between lamb average prices and lamb market volatility was determined in lamb market, no causality was found among other variables. However, the average price of the calf market has been determined to be the one-way reason for the volatility of the lamb market. Accordingly, while the lamb market has no effect on the calf market, the calf market affects the lamb market.

Conclusion

It is accepted that the AMM lamb and beef carcass price indexes, which are accepted as the red meat indicator price in Turkey, exhibit random progress and accordingly their indices are not related to the past price data and the instant data is reflected in the price.

When the prices in the markets are considered as a result of the instantaneous data, it is understood that the most important factor among the factors is the amount of beef processing. In the AMM, lamb prices are directly affected by beef prices, but lamb prices have no effect on beef prices. The reason for this is thought to be that the lamb processing quantities are well below the calf processing quantities. There is no effect on the transaction amount of the volatility of the prices when the transaction amount is considered as the effect on the price volatility. In the AMM and indirectly, it is understood that the amount of transactions is a major factor in realistic prices in red meat market. Accordingly, increasing the transaction volume of the AMM will contribute to a more realistic price formation.