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Dynamic Price Discovery in Chinese Agricultural Futures Markets

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Abstract

This paper intends to provide comprehensive results of the price discovery function of Chinese futures markets based on three common measurements of average price discovery contribution and more importantly, the dynamic price discovery measurement. Using daily futures and spot prices from fourteen varieties, we find eight varieties to be efficient in price discovery. The results also support that more trading volume do not lead better price discovery performance of the futures market (Adämmner, Bohl, and Gross, 2016). Our findings are important for both domestic and international producers and contracts users of Chinese agricultural commodities to be effective in hedging.

Introduction

Chinese agricultural futures markets have witnessed great massive growth along with the rapid economic development and financial market improvement: In 2018, the total trading value in DCE and ZCE were up to 52.2 and 38.22 trillion CNY, respectively.

Price discovery performance is particularly important for agricultural commodities as the futures market provides timely information to economic entities when they make decisions on production, storage, processing, and consumption .

The existing studies on price discovery in agricultural commodity markets are largely devoted to well-developed futures markets and find that futures markets play a dominant role in the price discovery process.

By contrast, the DCE and ZCE were established in the 1990s; nearly half of the agricultural futures contracts have been traded for less than 10 years.

Though price discovery in Chinese agricultural markets has drawn some attention, most of the existing studies examined the average contribution to price discovery process, based on a constant parameter vector error correction model (VECM). Dynamic price discovery contribution is largely neglected.

Research on determinants of price discovery has attracted considerable interest among scholars in recent years. Evidence from European agricultural markets suggests that trading activity is closely related to efficient price discovery, but empirical research focusing on emerging markets like China is also scarce.

Motivation

- To examine the price discovery dynamics in Chinese agricultural futures markets based on a time-varying VECM
- To obtain a comprehensive judgment on overall price discovery performance in Chinese agricultural futures markets by covering nearly all traded agricultural contracts
- To explore the common and different characteristics of price discovery dynamics among some futures varieties
- To provide empirical evidence on whether there is a positive relationship between trading volume and price discovery performance in an emerging futures market

Methodology

- Measuring price discovery on average
 - Information share (IS)
 - Component share (CS)
 - Common factor weights (CFW)
- Measuring price discovery dynamics
 - Reformulating VECM in state-space form
 - Using Kalman filter to estimate time-varying parameters

Results

Table 1. Average price discovery contribution of futures traded in DCE

	Corn	Corn Starch	No.1 Soybeans	No.2 Soybeans	Soybean Oil	Soybean Meal	Palm Olein	Egg
IS	0.956	0.928	0.451	0.942	0.875	0.418	0.681	0.956
CS	0.624	0.791	0.325	0.726	0.869	0.317	0.624	0.886
CFW	0.624	0.742	0.419	0.763	0.995	0.399	0.577	0.950

Table 2. Average price discovery contribution of futures traded in ZCE

	Wheat	Rapeseed Meal	Rapeseed	Cotton	White Sugar	Early Rice
IS	0.719	0.530	0.561	0.852	0.535	0.925
CS	0.434	0.347	0.368	0.358	0.426	0.577
CFW	0.481	0.358	0.557	0.559	0.403	0.453

Figure 1. Time-varying CFWs and trading volumes

Conclusion

Futures contracts of corn, corn starch, No.2 soybeans, soybean oil, palm olein, and egg traded in DCE, as well as the futures contracts of wheat and cotton are efficient in price discovery.

Trading volume is very important for efficient price discovery when the trading activity is extremely low.

The No.2 futures contract is a much better candidate for price discovery than the No.1 futures contract

The price discovery of the futures markets are unstable at their infancy stage

The contracts in DCE perform better price discovery than the contracts in ZCE.

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