

Agricultural Market Integration of China and its Implications on Food Security

Authors in alphabetic order; should be changed according to their contributions:

Eddy Bekkers**, Martina Brockmeier*, Fan Yang*

* University of Hohenheim, Chair of International Agricultural Trade and Food Security, Germany

** Johannes Kepler University, Faculty of Economics, Austria; WTI, World Trade Institute, Bern, Switzerland

Table of Contents

1. Background
2. Estimation of Agricultural Market integration in China
 - 2.1. Food Price Transmission
 - 2.2. Methods and Models
 - 2.3. Data and Empirical Results
3. Simulations with the Global Trade Analysis Project (GTAP) Framework
 - 3.1. Modification in GTAP
 - 3.2. Implications on Regional Trade Agreements
4. Conclusions
5. References

Introduction

China was pointed out to increase the world food price volatility during the 2007/08 for two reasons: its tremendous demand on agricultural products and imposing of export restraints on certain agricultural products including grains (Trostle, 2008). "Feeding China" is highlighted in recent OECD-FAO Agricultural Outlook in ensuring the global food security (OECD-FAO, 2013). Since joining the WTO, China and world agricultural market witness closer tightness (Huang et al., 2009). While continued discussion focuses on the pressure of China's demand on world food market, it is also important to see how changes of world food prices actually affect the welfare of food producers and consumers in China. To address those two issues, it becomes essential to analyze how the agricultural market integration of China affects food security of its own population and of other countries.

The agricultural market of China was heavily controlled by the central state of the government until late 1980s. After several decades of gradual liberalization of the market, the domestic market becomes more integrated, and the share of agricultural and food trade of China in the total world trade improves considerably. China is now the third largest importer and fifth largest exporter of agricultural and food commodities in the world (FAOSTAT, 2014). This growing market integration strengthens the co-movement of farm-gate, consumer and international prices for agricultural products. Research on domestic meat price transmission shows improved market efficiency (Xu et al., 2012; Liu et al., 2012). Evidences of cointegration between China's and international food prices can be found in literature, especially for the period before the outburst of food crisis in 2007 (Imai et al., 2008; Huang et al., 2013). During the food crisis, political measures are undertaken to stabilize domestic agricultural prices. Cereal market is protected and at least in the short run to be isolated from the world market (Yang et al, 2008). Yet the short-run price transmission elasticity for agricultural commodities is not consistent in existing literature. Take rice for example. Baltzer (2013) identifies China as the export stabilizer of rice with lower price transmission. The same conclusion is found in Dawe (2009) and Huang (2013), their estimation of the short-run price transmission for rice from world market to China is lower than 0.05. However, Wang and Xie (2011) calculate this elasticity on rice for 0.21, and Imai et al. (2008) for 0.44.

The deviation in the value for short-run elasticities may result from different estimation methods and data source. However, the differences in market integration affect food security, e.g. consumer/producer welfare in both China and other countries. Existing literature does not take into account the spillover effect. In this paper, we address the issue of agricultural market integration of China by studying price transmission for different agricultural and food products, and investigate its global impact on food security. To reach this goal, we engage in two-step exercise. Firstly, by collecting historical data on farm-gate and consumer food

prices, world food prices and exchange rates, we estimate the long- and short-run price transmission for agricultural and food products for China. We then extend our analysis to an economic-wide analysis, namely incorporate the results from econometric estimation into a CGE model: Global Trade Analysis Project (GTAP). Valenzuela et al. (2007) addresses the lack of imperfect pass-through in the GTAP model. They incorporate active market insulation measures by importers generating imperfect price transmission between world and domestic prices. The goal of their exercise is to reduce price volatility in net importers and raise volatility in net exporters in the model to bring the model more in line with the empirical findings. We conduct similar exercise by extending the analysis across all the countries for agricultural commodity and study its impact on food security.

The advancement of this paper is that it goes beyond the "business as usual" analyzes of price transmission utilizing econometric estimation by combining CGE technical. Furthermore, our analysis covers cross sectors and cross-countries data on food prices. We specially check the robustness of different database in our results.

The remainder of the paper is organized as the following: Section 2 describes econometric estimation on food price transmission and related data issues; the modification of GTAP for price transmission analyze is included in section 3; section 4 displays the results and conclusions are drawn in section 5.

References

Baltzer, K. (2013): International to domestic price transmission in fourteen developing countries during the 2007-08 food crisis. *WIDER Working Paper*. No. 2013/031

Dawe, D. (2009): Cereal price transmission in several large asian countries during the global food crisis. *Asian Journal of Agriculture and Development*, 6 (1), 2.

FAOSTAT (2014): Retrieved 02/04/2014 from <http://faostat.fao.org/>.

Huang, J., Liu, Y., Martin, W. and Rozelle, S. (2009): Changes in trade and domestic distortions affecting China's agriculture. *Food Policy*, 34 (5), 407-416.

Huang, J., Yang, J. and Rozelle, S. (2013) The political economy of food pricing policy in China. *WIDER Working Paper*. No. 2013/038.

Imai, K., Raghav G, and Ganesh T. (2008): Transmission of world commodity prices to domestic commodity prices in India and China. *School of Social Sciences (Economics), University of Manchester, UK*.

Liu, B., Keyzer, M., Van den Boom, B. and Zikhali, P. (2012): How connected are Chinese farmers to retail markets? New evidence of price transmission. *China Economic Review*, 23(1), 34-46.

OECD-FAO (2013): OECD-FAO Agricultural Outlook.

Valenzuela, E., Hertel, T. W., Keeney, R. and Reimer, J. J. 'Assessing Global Computable General Equilibrium Model Validity Using Agricultural Price Volatility', *American Journal of Agricultural Economics*, Vol. 89, (2007) pp. 383–397.

Wang, X. and Xie, S. (2012): How do prices of foreign agricultural products affect prices of Chinese agricultural products? *经济研究*, 2012 (3), 141-153.

Xu, S. W., Li, Z. M., Cui, L. G., Dong, X. X., Kong, F. T. and Li, G. Q. (2012): Price transmission in China's swine industry with an application of MCM. *Journal of Integrative Agriculture*, 11(12), 2097-2106.

Yang, J., Qiu, H., Huang, J. and Rozelle, S. (2008): Fighting global food price rises in the developing world: the response of China and its effect on domestic and world markets. *Agricultural Economics*, 39(s1), 453-464.