

University of Nebraska - Lincoln
DigitalCommons@University of Nebraska - Lincoln

Cornhusker Economics

Agricultural Economics Department

7-25-2018

Agricultural Market Liberalization and Household Food Security in Rural China

Lia Nogueira

University of Nebraska-Lincoln

Kathy Baylis

University of Illinois at Urbana-Champaign

Linlin Fan

Mississippi State University

Follow this and additional works at: https://digitalcommons.unl.edu/agecon_cornhusker

Part of the [Agricultural Economics Commons](#), and the [Economics Commons](#)

Nogueira, Lia; Baylis, Kathy; and Fan, Linlin, "Agricultural Market Liberalization and Household Food Security in Rural China" (2018). *Cornhusker Economics*. 959.

https://digitalcommons.unl.edu/agecon_cornhusker/959

This Article is brought to you for free and open access by the Agricultural Economics Department at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Cornhusker Economics by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

Cornhusker Economics

Agricultural Market Liberalization and Household Food Security in Rural China

Market Report	Year Ago	4 Wks Ago	7-20-18
Livestock and Products,			
Weekly Average			
Nebraska Slaughter Steers, 35-65% Choice, Live Weight.	120.00	109.00	*
Nebraska Feeder Steers, Med. & Large Frame, 550-600 lb.	*	187.76	160.00
Nebraska Feeder Steers, Med. & Large Frame 750-800 lb.	171.94	154.39	162.05
Choice Boxed Beef, 600-750 lb. Carcass.	207.88	218.65	204.32
Western Corn Belt Base Hog Price Carcass, Negotiated	82.89	77.79	66.68
Pork Carcass Cutout, 185 lb. Carcass 51-52% Lean.	102.94	84.53	81.14
Slaughter Lambs, woolled and shorn, 135-165 lb. National.	182.28	162.41	162.44
National Carcass Lamb Cutout FOB.	431.08	374.39	383.96
Crops.			
Daily Spot Prices			
Wheat, No. 1, H.W. Imperial, bu.	3.83	4.20	4.61
Corn, No. 2, Yellow Columbus , bu.	3.41	3.38	3.44
Soybeans, No. 1, Yellow Columbus , bu.	9.22	8.66	7.78
Grain Sorghum, No.2, Yellow Dorchester, cwt.	5.75	5.10	5.31
Oats, No. 2, Heavy Minneapolis, Mn, bu.	3.26	2.89	2.82
Feed			
Alfalfa, Large Square Bales, Good to Premium, RFV 160-185 Northeast Nebraska, ton.	165.00	*	180.00
Alfalfa, Large Rounds, Good Platte Valley, ton.	82.50	107.50	110.00
Grass Hay, Large Rounds, Good Nebraska, ton.	80.00	105.00	100.00
Dried Distillers Grains, 10% Moisture Nebraska Average.	105.00	115.00	105.00
Wet Distillers Grains, 65-70% Moisture Nebraska Average.	39.50	38.50	36.83
* No Market			

Recent World Trade Organization (WTO) disputes have brought China's agricultural trade policy back into the spotlight. In November 2008, China issued the nation's first Outline of Medium and Long-term Plan for National Food Security (China Central People's Government, 2008), in which they stipulate that the country will seek to stabilize the area sown to grain and achieve more than 95% grain self-sufficiency. Trade restrictions are argued to support implementing this plan because increased imports of grains and soybeans will lower prices, causing grain and soybean farmers to leave farming, thereby generating food insecurity (Wong and Huang, 2012). Others suggest that China may not have a comparative advantage in grain or soybean production, and switching to higher-value agriculture or working off-farm could increase the incomes of both rich and poor farmers (Zhu, Hare, and Zhong, 2010). In this article, we evaluate the effect of past agricultural market liberalization on rural Chinese household food security as a measure of household welfare. Because market liberalization is likely to differ in its effect across households, we explore the distributional effect of liberalization on rural household food security. We find that liberalization primarily improves household food security by increasing off-farm income, and the effects vary greatly by initial food security status and producer types.

Prior to its accession to the WTO in 2001, China substantially reformed its agricultural markets, prices and trade. From 1992 to 1998, the average agricultural import tariff rate fell from 42% to 24%, and domestic agricultural policy reforms dramatically decreased market distortions (MOFTEC, 2001; Huang et al., 2009). The government lowered the mandatory amount of grain farmers had to sell to the govern-

ment, called the grains quota, and reduced the price disparity between in-quota versus out-of-quota sales, fully eliminating the grains quota around 2000. The government also decentralized much of the agricultural trading authority, reduced the scope of non-tariff barriers and relaxed licensing procedures for some crops (Huang and Chen, 1999). Over the same time, the government invested heavily in infrastructure and significantly reduced transaction costs in domestic agricultural markets (Fan, Zhang and Zhang, 2004; Fan and Chan-Kang, 2005; Luo et al., 2007).

Agricultural production value, off-farm income and household food security rose over this time. We find that the share of calories from non-staples (SCNS) in rural China increased by 5 percentage points, from 21% in 1989 to 26% in 2000, where a SCNS of greater than 16% is a reasonable measure of being out of hunger (Jensen and Miller, 2010). That said, rural poverty and food insecurity are still a salient concern. Economic growth has been concentrated in urban areas and urban incomes are now more than three times higher than their rural counterparts. Poverty remains primarily a rural phenomenon, with 99% of the poor in China coming from rural areas (World Bank, 2009). In 2010, 152 million people (11.2%) in rural China still lived under the poverty line of less than \$1.90 per person per day (World Bank, 2014), and in 2015, 133.8 million people were food insecure with food intake insufficient to meet daily energy requirements (FAO, 2015). Improving access to adequate quantity and diversity of nutrients in rural areas is a major objective for Chinese policy makers (Mangyo, 2008; Huang and Rozelle, 2009; de Brauw and Mu, 2011).

We identify the effect of market liberalization by noting that while liberalization is largely driven by central government policies, it will affect each community differently. Some markets are more isolated than others and will be less affected by the decrease in protection from the world market. We measure the degree of local market liberalization by using the price difference between world, regional and local prices for seven agricultural products. This metric captures both transportation costs and policies such as non-tariff barriers that are hard to quantify.

Following Jensen and Miller (2010), we use the household's share of calories from non-staples as our measure of food security. We control for time-invariant unobserved household characteristics through household fixed effects and agro-climatic shocks and general economic trends through county by year dummy variables. To isolate the effects of liberalization on food security solely through income, we also control for other potential channels through which liberalization could affect household food security, namely demographics, changes in market access, information and food prices. By using a longitudinal household survey (the China Health and Nutrition Survey, CHNS), we can analyze the impacts of liberalization econometrically without

restrictive assumptions such as complete markets and perfect information common in simulation models of trade liberalization.

Agricultural market liberalization may affect different rural households differently. While wealthy and well-educated farmers may benefit from increased off-farm work opportunities and income (Wang et al., 2009), the poorest farmers may lack access to income-generating assets, credit and technology, and thus have limited ability to switch production or seek off-farm jobs, making them vulnerable to market liberalization (Chen and Ravallion, 2004; Anderson, Huang and Ianchovichina, 2004). Conversely, agricultural market liberalization can improve agricultural efficiency, increase rural household income of the poor and enhance household access to food (Kennedy and Cogill, 1988; Ingco, 1997; Huang, Li and Rozelle, 2003; Huang et al., 2007).

Trade theory would predict that producers of export-oriented products (hereafter called export producers) benefit from agricultural market liberalization and producers of import-competing products (hereafter called import producers) may lose from liberalization (Huang, Li and Rozelle, 2003; Huang et al., 2007). While prior research has studied how economic reforms affect the distribution of *urban* residents' nutrition availability (e.g. Meng, Gong and Wang, 2009), it is unclear how liberalization affects the food security of the full distribution of households living in rural areas.

Existing research on the effect of agricultural reforms largely focuses on how liberalization affects agricultural production value and thereby farmers' welfare. But off-farm jobs can be an effective way for farmers to raise income and reduce rural poverty (Rozelle, 1996; de Janvry, Sadoulet and Zhu, 2005; de Brauw and Giles, 2018). Based on the CHNS, from 1989 to 2000, off-farm income gradually increased from 30% to 50% of total rural income. Therefore, unlike much previous research, we analyze how agricultural market liberalization affects farmers both through agricultural production value and off-farm income.

Because food-secure and insecure households face different tradeoffs from market liberalization, we use Instrumental Variable Unconditional Quantile Regressions to study the distributional effects of market liberalization on household food security while addressing the endogeneity of agricultural production and off-farm income. This article is the first empirical application that addresses the endogeneity of *continuous* regressors when analyzing the unconditional distributional effects. By comparing effects at several points on the unconditional distribution of SCNS, this article can evaluate the impact of market liberalization on the most vulnerable population.

We find that the largest effect of liberalization is through facilitating off-farm employment, particularly for food-secure households. An average food-secure export and import household increases their consumption of calories from non-staples by 9,633 and 6,179 calories per person per year, a consumption equivalent to 12.7 and 8.1 pounds of pork (13.6% and 11.4% increase) respectively. By relaxing the grains quota, farmers had more freedom to work off-farm, potentially increasing their income. Further, market liberalization may have caused some farmers and local processors to specialize in the production of agricultural products in which China has a comparative advantage. This specialization may have increased the demand for labor. We also find that market liberalization does not substantially improve food security for food-insecure households. In particular, import-producing households who are food insecure appear to be worse off after agricultural market liberalization. Specifically, agricultural market liberalization causes food-insecure import producers to decrease their caloric intake by 2,129 calories per person per year; the same calories provided by 2.8 pounds of pork (28.2% decrease). Our findings suggest that while some farmers clearly benefited from market liberalization, some food-insecure rural households may have been left behind. Agricultural market liberalization may have contributed to inequality in income and level of food security in rural China.

This article is based on:

Baylis, K., L. Fan and L. Nogueira. 2018. "Agricultural Market Liberalization and Household Food Security in Rural China." *American Journal of Agricultural Economics*, Advanced Access Published: 18 June 2018, <https://doi.org/10.1093/ajae/aay031>

This research uses data from China Health and Nutrition Survey (CHNS). We thank the National Institute for Nutrition and Health, China Center for Disease Control and Prevention, Carolina Population Center (P2C HD050924, T32 HD007168), the University of North Carolina at Chapel Hill, the NIH (R01-HD30880, DK056350, R24 HD050924, and R01-HD38700) and the NIH Fogarty International Center (D43 TW009077, D43 TW007709) for financial support for the CHNS data collection and analysis files from 1989 to 2015 and future surveys, and the China-Japan Friendship Hospital, Ministry of Health for support for CHNS 2009, Chinese National Human Genome Center at Shanghai since 2009, and Beijing Municipal Center for Disease Prevention and Control since 2011.

References

- Anderson, K., J. Huang, and E. Ianchovichina. 2004. "Will China's WTO Accession Worsen Farm Household Incomes?" *China Economic Review* 15 (4): 443-456.
- Chen, S., and M. Ravallion. 2004. "Welfare Impacts of China's Accession to the World Trade Organization." *The World Bank Economic Review* 18(1): 29-57.
- China Central People's Government. 2008. "Outline of Mid- and Long-term Plan for National Food Security 2008-2020." (in Chinese) http://www.gov.cn/jrzq/2008-11/13/content_1148414.htm. Access on April 4, 2018.
- de Brauw, A. and J. Giles. 2018. "Migrant Labor Markets and the Welfare of Rural Households in the Developing World: Evidence from China." *World Bank Economic Review*. 32(1): 1-18.
- de Brauw, A., and R. Mu. 2011. "Migration and the Overweight and Underweight Status of Children in Rural China." *Food Policy* 36(1): 88-100.
- de Janvry, A., E. Sadoulet and N. Zhu. 2005. "The Role of Non-Farm Incomes in Reducing Rural Poverty and Inequality in China." Working paper, Department of Agricultural and Resource Economics, University of California, Berkeley.
- Fan, S., and C. Chan-Kang. 2005. *Road Development, Economic Growth, and Poverty Reduction in China*. Washington D.C.: International Food Policy Research Institute.
- Fan, S., L. Zhang and X. Zhang. 2004. "Reforms, Investment, and Poverty in Rural China." *Economic Development and Cultural Change* 52(2): 395-421.
- FAO (Food and Agriculture Organization of the United Nations). 2015. "The State of Food Insecurity in the World." Washington D.C.: FAO.
- Huang, J., and C. Chen. 1999. "Effects of Trade Liberalization on Agriculture in China: Institutional and Structural Aspects." Working paper, Bogor, Indonesia: United Nations ESCAP CGPRT Centre.
- Huang, J., N. Li, and S. Rozelle. 2003. "Trade Reform, Household Effects, and Poverty in Rural China." *American Journal of Agricultural Economics* 85 (5): 1292-1298.

- Huang, J., Y. Liu, W. Martin, and S. Rozelle. 2009. "Changes in Trade and Domestic Distortions Affecting China's Agriculture." *Food Policy* 34(5): 407-416.
- Huang, J., and S. Rozelle. 2009. "Agricultural Development, Nutrition, and the Policies Behind China's Success." *Asian Journal of Agriculture and Development* 7(1): 1-34.
- Huang, J., J. Yang, Z. Xu, N. Li, S. Rozelle and N. Li. 2007. "Agricultural Trade Liberalization and Poverty in China." *China Economic Review* 18(3): 244-265.
- Ingco, M.D. 1997. "Has Agricultural Trade Liberalization Improved Welfare in the Least-Developed Countries?" World Bank Publications.
- Jensen T. R., and N. H. Miller. 2010. "A Revealed Preference Approach to Measuring Hunger and Undernutrition." NBER working paper 16555.
- Kennedy, E., and B. Cogill. 1988. "The Commercialization of Agriculture and Household-Level Food Security: The Case of Southwestern Kenya." *World Development* 16 (9): 1075-1081.
- Luo, R., C. Liu, L. Zhang, and S. Rozelle. 2007. "Investing in Rural China: A Report on a Survey of Public Infrastructure Investment." Working paper, Beijing: Center for Chinese Agricultural Policy, Institute of Geographical Sciences and Natural Resource Research, Chinese Academy of Sciences, China.
- Mangyo, E. 2008. "Who Benefits More from Higher Household Consumption? The Intra-household Allocation of Nutrients in China." *Journal of Development Economics* 86(2): 296-312.
- Meng, X., X. Gong, and Y. Wang. 2009. "Impact of Income Growth and Economic Reform on Nutritional Availability in Urban China: 1986-2000." *Economic Development and Cultural Change* 57(2): 261-295.
- MOFTEC [Ministry of Foreign Trade and Economic Cooperation]. 2001. *Individual Action Plan on Trade and Investment Liberalization and Facilitation 2001 of the People's Republic of China*. Unpublished document, MOFTEC, Beijing, China.
- Rozelle, S. 1996. "Stagnation without Equity: Patterns of Growth and Inequality in China's Rural Economy." *China Journal* 35(1): 63-96.
- Wang, H., X. Dong, S. Rozelle, J. Huang., and T. Reardon. 2009. "Producing and Procuring Horticultural Crops with Chinese Characteristics: The Case of Northern China." *World Development* 37(11): 1791-1801.
- Wong, J., and Y. Huang. 2012. "China's Food Security and Its Global Implications." *China: An International Journal* 10(1): 113-124.
- World Bank. 2009. "China – From Poor Areas to Poor People: China's Evolving Poverty Reduction Agenda - An Assessment of Poverty and Inequality." Washington, DC: World Bank.
- World Bank. 2014. Poverty and Equity Databank, <http://povertydata.worldbank.org/poverty/country/CHN>. (Accessed on May 4, 2016)
- Zhu, J., D. Hare, and F. Zhong. 2010. "Food Consumption for the Poor: A Supply or an Income Issue? Evidence from Less-favored Regions in Rural China." Paper presented at AAEA annual meeting, Denver CO., 25-27 July.

Lia Nogueira

Assistant Professor
Department of Agricultural Economics
University of Nebraska-Lincoln
lia.nogueira@unl.edu

Kathy Baylis

Associate Professor
Agricultural and Consumer Economics
University of Illinois at Urbana-Champaign

Linlin Fan

Assistant Professor
Agricultural Economics
Mississippi State University