

Public Abstract

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Title:Three Essays on Agricultural Policy and Food Demand

To understand better the effect of policy and technology on agricultural markets, I study three topics about agricultural policy and food demand in this dissertation. My first essay identifies the worldwide historical pattern of wheat support and predicts the future trend of wheat support. Based on the theory of political economy, it is proposed that the income level is one factor that determines agricultural support. To provide the empirical evidence to substantiate this theory, I test the relationship between wheat support and income by building a fixed effect model with the historical data of 55 countries from 1961 to 2011. Besides income, several other factors are also considered, including three dummies for food spikes, trade status, per capita arable land area, agricultural population rate, and a shift variable that serves as a proxy for Uruguay Round Agreement Act implementation. The results indicate that there are statistically significant effects of income, income square, and income cubed on wheat support. In addition, I project that the future wheat support levels of China and India, especially border market support, might continue to rise with income growth. Meanwhile, Japan might maintain its high level of wheat support into the future.

In the second essay, I examine the effect of government stock policies on the outcomes of China wheat market. Since 2006, the Chinese government used strategic reserve and marketing auctions to influence wheat market outcomes. Yet relatively little is known about how these policies affect wheat market prices in China. I develop and use a structural economic model to conduct a counterfactual analysis in this study. I evaluate the wheat market effects of government marketing activities during the period 2006/07 to 2013/14. I also perform sensitivity analysis to estimate the impacts of alternative displacement degrees between government stocks and private stocks, domestic area response, corn prices changes, and alternative price elasticities of stock demand. The results indicate that the government stock policies stabilized wheat market prices, if measured by the standard deviation of annual prices, and raised the wheat production in China over the year 2006-2013.

In the third essay, I assess the effects of new technology adoption on food consumption. I test the effect of refrigerator ownership on food consumption in rural China during the period when the refrigerator ownership in rural China increased from 14% in 2001 to 45% in 2010. I use two methods to develop models and perform empirical tests. First, I estimate two-way fixed effect model based on single-equation demand function that explains consumption using own price, cross prices, and household characteristics. The results show that refrigerator ownership had a statistically significant and negative effect on meat consumption quantities. Annual meat consumption per capita would decrease 1 kilogram with 1% increase in refrigerator ownership rate. Second, I develop a demand system model, and link refrigerator ownership to food expenditure in an auxiliary equation. The results indicate that refrigerator ownership has a statistically significant and negative effect on total food expenditure, while it has a statistically significant and positive effect on the expenditure share of meat, egg, seafood, and negative effect on grain and fruit. Moreover, without considering refrigerator, the price and income elasticities of different food might be overestimated or underestimated. Taking meat for example, the income elasticity might be overestimated without considering refrigerator, which might lead to higher meat demand projection in the future with income growth. Therefore, I conclude that refrigerator ownership might reduce total food expenditure and meat consumption quantity, and that refrigerators may change food consumption pattern, by increasing the expenditure share of meat, egg, seafood, and decreasing the food expenditure share of grain, fruits, that the future food demand projection in rural China might be biased without considering refrigerator ownership. To enumerate a few underlying reasons that could lead to these results, refrigerators might help reduce the food losses or waste

by changing the way people store food, the frequency with which people buy food, and the food mix people consume. This study might provide evidence on some of the benefits and costs of subsidizing the purchases of refrigerators in the developing countries.