Journal of Agricultural and Applied Economics, 44,3(August 2012):423–425

Discussion: Causes of Agricultural and Food Price Inflation and Volatility

Norbert Wilson

This discussion is a review and critique of the three papers in the 2012 Southern Agricultural Economics Association invited paper session titled Causes of Agricultural and Food Price Inflation and Volatility.

Key Words: biofuels, food prices, fuels, volatility, inflation, vector autoregression

JEL Classifications: Q13, Q18

This trio of papers attempts to add to the growing literature on food price volatility. From searches of EconLit and Web of Science, one can easily find between 60 and 80 articles on this and related topics. The majority of these articles were published in 2011, but the rate of publication in 2012 thus far suggests that even more articles will try to parse this complex topic. In addition to articles and reports, at least two books investigate the connections between food prices and related factors, specifically various fuels (Schmitz et al., 2011; Westhoff, 2010). The invited papers add to this burgeoning literature with varying degrees of success. Though none of the articles is the final word on the topic, they provide insights into the causes of the recent price spike.

Disentangling Corn Price Volatility: The Role of Global Demand, Speculation, and Energy

McPhail, Du, and Muhammad (2012) explore the interaction of the price of corn at the Chicago Mercantile Exchange to four other related series from January 2000 to July 2011. The other five series are the Baltic Exchange Index, which is a proxy for global demand for corn; the imported crude oil price; U.S. ethanol production; Working's speculative indexes; and the trade weighted index of major currencies, such as the value of the U.S. dollar. The authors find evidence that within the first month shocks in real corn prices are the most important source of price increases in corn. Speculation is the second most important. Six months later global corn demand becomes the most important shock. In the long run, however, the largest contributor to price shocks is crude oil prices.

Though they consider only these four factors, they recognize that the literature has pointed out at least seven factors that affect the price of corn. Naturally, the authors limit their work. However, are these four factors the most salient and most important. McPhail, Du, and Muhammad (2012) base their choice on their assessment of Baffes and Haniotis (2010), who argue that these factors are the most contentious. Are these the factors that matter the most in terms of understanding the price spike? While corn is vital, other feed grains and oil seeds experienced a price spike over the same period of time. Is this model appropriate for these other grains and oilseeds? As the authors

Norbert Wilson is associate professor, Department of Agricultural Economics and Rural Sociology, Auburn University, Auburn, Alabama.

rightly pointed out, the price increase had minor effects on U.S. consumers. Therefore, does modeling the U.S. price of corn, with the U.S. exchange rate and speculation, offer the most important area to consider?

McPhail, Du, and Muhammad (2012) use a structural vector autoregression (VAR) model with a variance decomposition to understand the effects of shocks in the related series on the corn price. A real strength of this paper is the use of the structural VAR. In contrast to a simple VAR modeling, the authors have some theoretical basis for the relationship among the five series. However, is this structure the best? The one presented makes sense, but it did not seem that it is the only structure that would follow. Further, if other structures make sense, would the findings have remained? The authors do not indicate that they considered other relationships among the various factors.

Additional theoretical and modeling choices that confirmed the findings of this paper would have strengthened their conclusions. Nevertheless, the findings are compelling and reasonable. It is one more statement of the limited role that speculation had on food prices and the long-run relationship between food and fuel.

Reexamining the Empirical Evidence of the U.S. Food Price Inflation

Baek and Koo present a slightly different view of the U.S. price increase. In the context of a cointegrated VAR, they model U.S. food prices as a series of endogenous food price indices (cereal/bakery, meat, dairy, fruit/vegetables, and nonalcoholic beverages) with three exogenous variables (the price of energy, U.S. dollar exchange rate, and commodity price index). The period of the study includes 110 monthly observations from November 2001 to December 2010. The choice of exogenous variables is based in part on a simple equilibrium model.

The paper mostly addresses the empirical developments, though no new modeling techniques seem to come from this work. The conclusions of the paper suggest a number of relationships (complements and substitutes) among the endogenous variables. Exchange rates have a significant effect on most of the products; the prices of energy and commodities tend to increase the prices of cereal/bakery, meat, and dairy products. Additionally, all of the products except for meat revert to their long-run equilibrium.

The model originally contained income in the demand and final equilibrium result. However, the authors dropped income, arguing that food is a small share of U.S. consumer income. This omission is surprising in light of model derivation and the great reduction of income over the period of study. A simple test of the significance of the income variable would have bolstered the results. Unlike McPhail, Du, and Muhammad (2012), no structure is provided to the relationships between the price indices. Like McPhail, Du, and Muhammad (2012), they focus solely on the United States though the effects of the food price increases had a small effect on U.S. consumers relative to the effect seen in the developing world.

Evaluating the Causes of Rising Food Prices in Low and Middle-Income Countries

Yeboah, Shaik, and Quaicoe (2012) attempt to address this concern by looking at the food price changes in a group of 37 developing countries. With annual data over an unspecified time period, the authors use a seemingly unrelated regression VAR (SUR/VAR) to show the connection of input prices (fertilizers and pesticides), income (per capita gross domestic product (GDP) and an indicator variable of low or middle-income status), and U.S. exchange rates to various food prices (maize, rice, sorghum, groundnut, soybeans, bananas, mangoes, oranges, and pineapples).

The modeling suggests that exchange rates have an effect on select food prices, but the effects are positive for contemporaneous exchange rates and negative for lagged exchange rates. This result suggests that contemporaneous depreciation of the dollar had a price-lowering effect of food but lagged exchange rates raised the price of food.

The authors should be commended for the great effort to look across multiple products and countries to unearth the causes of the price

increase. Presumably, low and middle-income countries are the ones most affected by food price inflation. However, was the modeling specification the best choice for this problem? Why were certain crops used and others avoided? Are these crops similarly consumed across the 37 countries? The SUR/VAR provides some structure to the empirical model, though the authors state little economic reasoning for the variables included or the models. Basically, the authors use an assortment of input and demand factors that may help explain the prices of certain commodities, but do these variables tell the true story of the price volatility? As mentioned in the session, the inclusion of per capita GDP and the dummy variable for income group are collinear. This modeling choice may explain the limited statistical significance of per capita GDP. The interpretation of the dummy variable is also problematic.

Conclusion

Westhoff (2010) explores the factors that contributed to the recent food price increase. He effectively uses a refrain, "Why the story is a little more complicated" in each chapter. Throughout each paper, an interjection and response of this refrain would have substantiated these papers. While the model techniques and data used are complex, the model choices and subsequent narrative do not reflect the complexity of the market for food. The more narrow perspectives of the papers do suggest a few important points: speculation may have had limited influence on the recent price increases. Exchange rates mattered, but exactly how is contextual.

Energy and other input prices contributed to the price increases of the past. The three papers in this session provide further evidence of a positive relationship between food and fuel prices.

References

Baffes, J., and T. Haniotis. "Placing the 2006/08 Commodity Price Book into Perspective." Policy Research Working Paper. The World Bank Development Prospects Group, 2010.

McPhail, L.L., X. Du, and A. Muhammad. "Disentangling Corn Price Volatility: The Role of Global Demand, Speculation, and Energy." *Journal of Agricultural and Applied Economics* 44,3(2012):401–10.

Schmitz, A., N.L. Wilson, C.B. Moss, and D. Zilberman. *The Economics of Alternative Energy Sources and Globalization*. Sharjah: Bentham Science Publishers, 2011.

Westhoff, P. *The Economics of Food: How Feeding and Fueling the Planet Affects Food Prices*. Upper Saddle River, NJ: FT Press, 2010.

Yeboah, O., S. Shaik, and O. Quaicoe. "Evaluating the Causes of Rising Food Prices in Low and Middle Income Countries." *Journal of Agricultural and Applied Economics* 44,3(2012): 411–22.